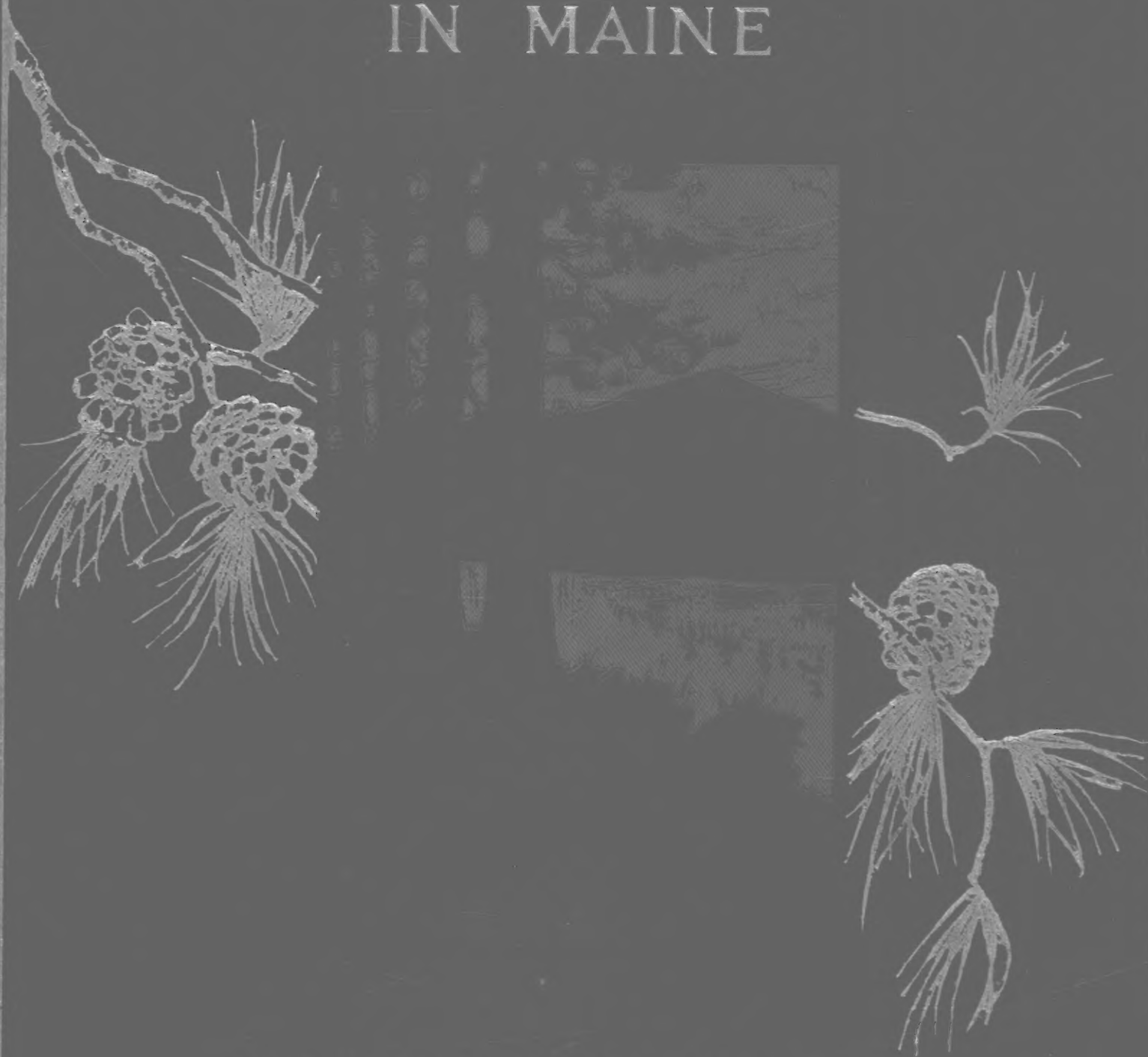


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# FOREST PROTECTION AND CONSERVATION IN MAINE



FORREST H. COLBY  
LAND AGENT AND FOREST COMMISSIONER

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## Forest protection and conservation in Ma

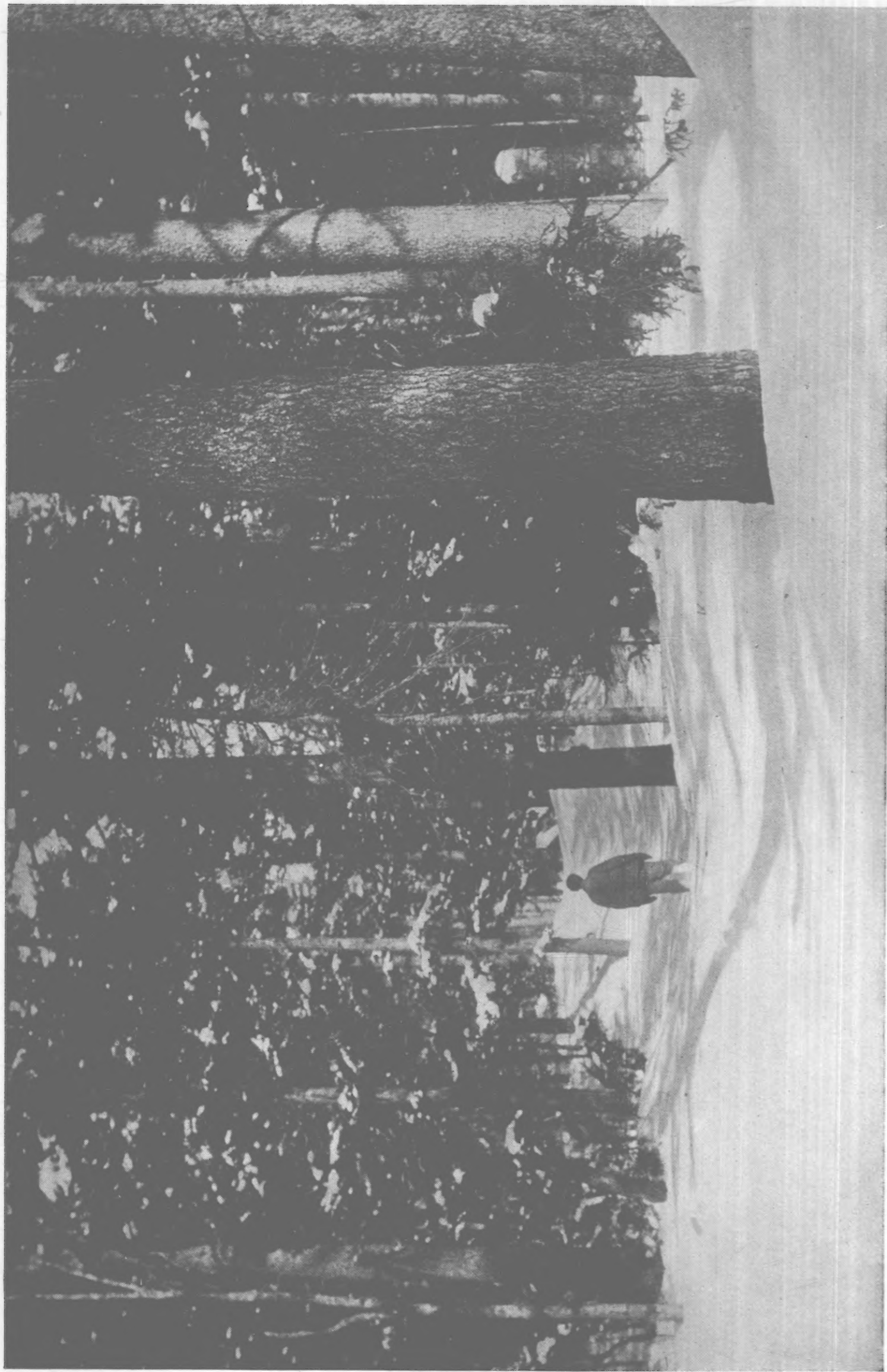


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"King Spruce."

Photo from E. B. Draper



FOREST  
PROTECTION  
—AND—  
CONSERVATION  
  
IN MAINE



1919

By FORREST H. COLBY  
Forest Commissioner

STATE OF MAINE.

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To His Excellency, Carl E. Milliken, Governor of Maine, and  
to all persons interested in forest fire protection and conservation  
of the forests of Maine, this volume is respectfully submitted.

FORREST H. COLBY,

*Forest Commissioner.*

## FORESTRY DEPARTMENT

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FORREST H. COLBY, Bingham, Maine.

*Deputy Forest Commissioner,*

NEIL L. VIOLETTE, Augusta, Maine.

*Clerk and Stenographer,*

LILLIAN J. COLEMAN, Augusta, Maine.

*Bookkeeper,*

HERBERT A. FOLSOM, Augusta, Maine.

*Director of Public Instruction in Forestry,*

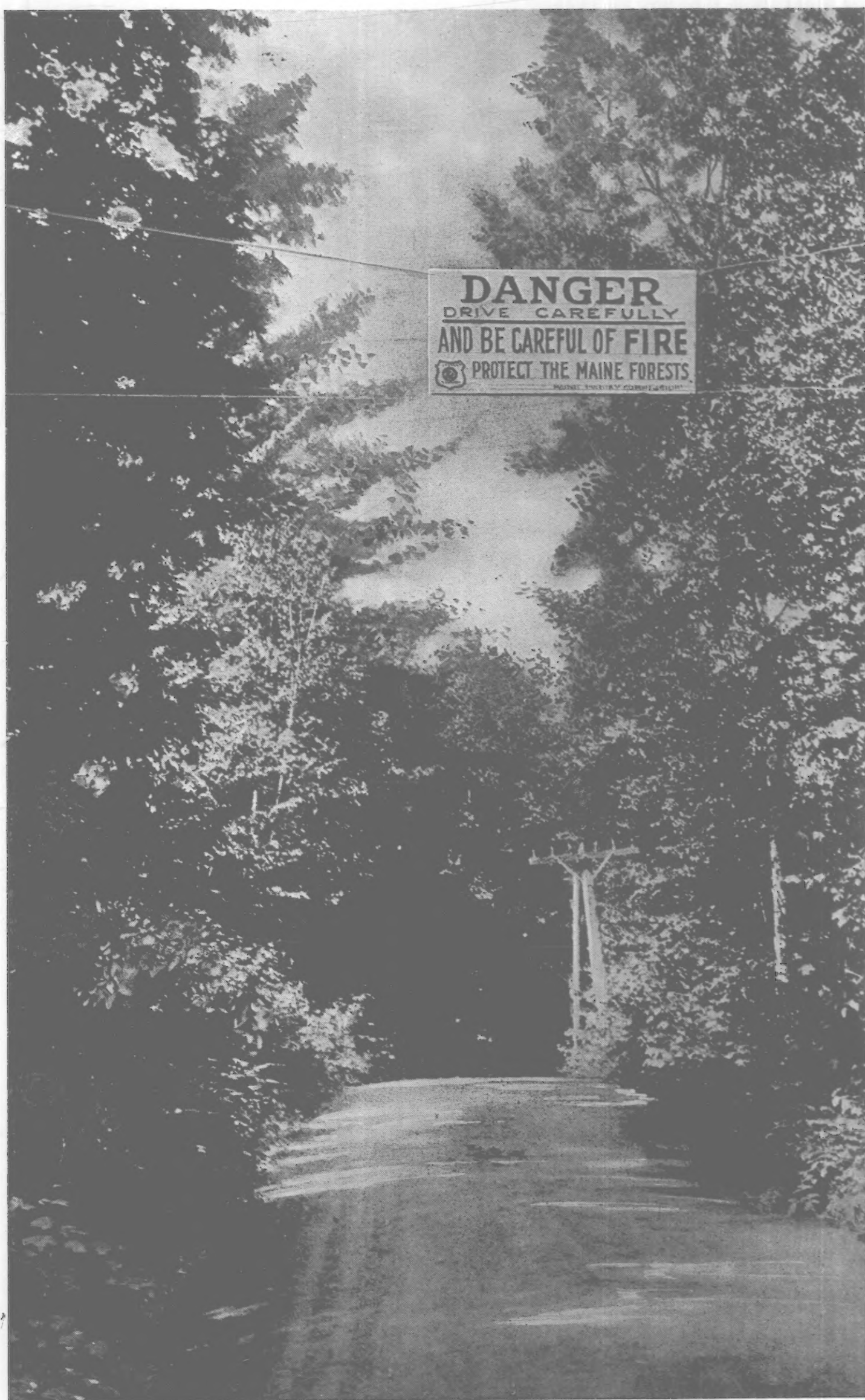
PROF. JOHN M. BRISCOE, Orono, Maine.

*Associated Professor of Forestry,*

PROF. C. W. L. CHAPMAN, Orono, Maine.

*Inspector of Slash,*

WARREN C. MERRILL, Skowhegan, Maine.



**"DANGER."**

**This effective warning is strung across the road at many points on all main highways that run through the Maine forests.**

**Photo by Maine Forestry Dept.**

STATE OF MAINE  
Forest Protection and Conservation in Maine.—1919.

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FOREWORD

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Forest Policies.



**I**N the present widespread discussion of forestry matters we are hearing a great deal and reading a great deal about "Forest Policies," the avowed object of these proposed policies being to make at least a beginning in the solution of our forest problems by bringing about a more economical use of our present stand of merchantable timber, by furnishing for our forest lands a greater measure of protection from fire and insects and disease and by establishing on our cut-over lands, on our burned areas and on our waste and barren tracts, through dili-

gent care of the young growth and by planting, a crop of young trees for future harvesting, to the end that we may have continued employment for our woodsmen and a future supply of raw material for our wood-using industries.

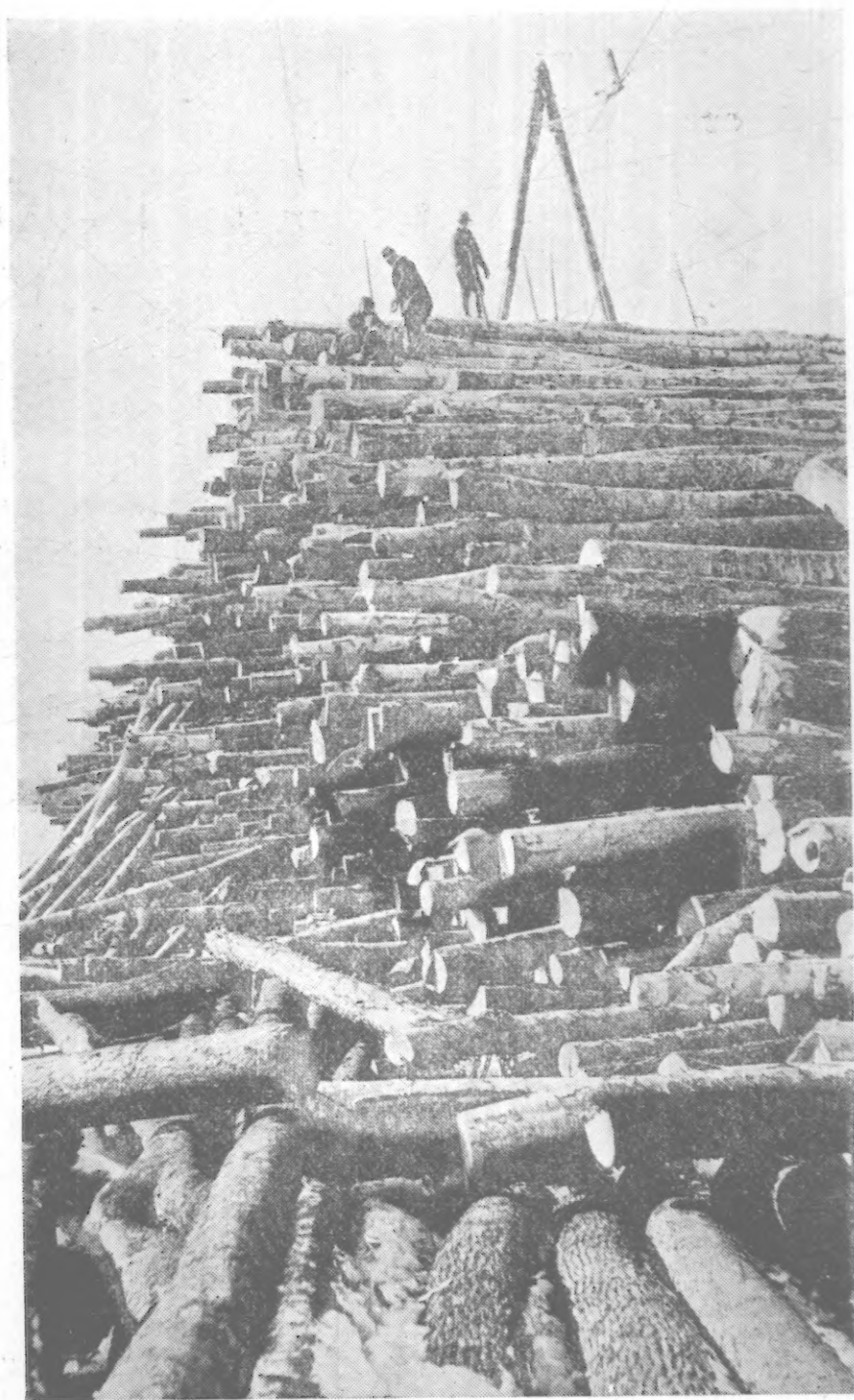
Beyond a doubt it is necessary and imperative that timberland owners, the manufacturers of wood products and the general public in our State of Maine begin to consider more seriously the future of our renowned Maine Woods. It is a fact not to be disputed that we are cutting off our forests to-day much faster than they are being reproduced, and we have been doing this for years.



While fortunately we still have large areas of timber of merchantable sizes, and thousands of acres of cut-over lands on which the young trees, with no other care than fire protection, are making marvelous growth, yet it would seem more logical and better business for us now to begin to consider how we may improve on present methods, rather than to await further depletion or delay reconstructive measures until our workers and our mills begin to

feel the pinch of an actual timber famine.

I am not inclined to take up much of the readers' time with criticism or fault finding as regards either past or present measures and practices of timberland owners in our State. That we have wasted our forests is a matter of common knowledge. But in considering our forest problems we may well adopt the philosophy of Phillips Brooks, that the best way to get rid of a past is by building a future out of it. With adequate measures of fire protection for



A Mammoth Tier of Hardwood in Bingham, Maine.

Photo by Maine Forestry Dept.



our mature timber and for our young growth, and with restocking of our idle lands by the agency of seeding or planting, the situation as to future supply may be wonderfully improved here in Maine.

In fact, it would seem that the natural forest conditions given us to work with are much better

here than in many other parts of the country. And in considering future supply we may begin to include grades and species of lumber never thought of as merchantable in the past. There is increasing demand for our hardwoods; and while we say that the hardwoods are not easily transported, we may safely forecast that a considerable demand will certainly bring much hardwood to market.

But for the present our chief concern is for the perpetuation of our more valuable soft wood species. We have in Maine no great areas of barren land. On our cut-over lands, in most instances, the natural reproduction of the soft woods is indeed remarkable, and if afforded proper protection, must give a very satisfactory yield. It is true that we have certain areas that have been burned over successively and these acres are not reforesting themselves with merchantable species. Also we have in certain sections areas of abandoned farm lands to consider. While the majority of these old abandoned fields are being reclaimed for forest growth by natural reseeding, there are many acres where a dense growth of bushes and hardwood sprouts have fairly taken possession of the soil and any harvesting of merchantable timber is obviously so far removed that we must consider such tracts as waste land.

In addition to stated areas that may be classed as waste land there are many other idle acres lying about. Some times on cut-over lands where reproduction on the whole is satisfactory, there



ROBUST SPRUCE SEEDLING GROWING IN OLD FIELD ABANDONED FIVE YEARS.

Under the edge of the spruce, at the left, is a thrifty young white pine seedling trying to grow on the same spot. With a five-acre field to settle in these two youngsters might better have chosen locations a few feet apart at least.

Photo by Maine Forestry Dept.

will be spots that bear no second growth of merchantable species. Also on that class of rough land distributed throughout our farming districts, and known as wood lots, in some instances there are many acres that must be classed as waste land, as they are producing little more than scrub and brush.



Pine Growth Fifty-two  
Years Old in Old Field.  
Photo by Maine Forestry Dept.

Any idle land in our State that is suited for growing a timber crop, and not suited for agriculture or other purposes, must be classed as waste land. Only by reforesting these idle lands can we shield ourselves from the charge of thriftlessness and mismanagement. Almost in a day we have been removed from the easy going times of former years, when waste was overlooked and condoned, to the present period of stringency and high prices, when we can ill afford to tolerate waste and idleness. To a large extent this sudden change in economic conditions has been precipitated by the World War. The billions of dollars borrowed by our government to carry on that worthy cause constitute, in fact, a mortgage on all our resources. Only the land itself can pay this enormous debt. The products of the farm, the mine and the forest, in the form of food and raw materials, furnish the basis of life and industry, and if we are to continue to thrive and develop as a nation, every effort must be devoted to production and economy.

In Maine our greatest resource is land—land the major part of which is chiefly valuable for growing a timber crop. In the past the harvesting of the trees from this land, and their manufacture into lumber, pulp, paper and a hundred and one other valuable



#### PULPWOOD OPERATION.

It is interesting to compare this picture with the frontispiece on page 2. It shows what the most beautiful of forest growth may look like after a pulpwood operation. At present the greater part of Maine's forest production is pulpwood. This State is the greatest consumer of pulpwood in the United States and the demand is ever increasing.

Photo by Maine Forestry Dept.



#### YOUNG SEEDLINGS SPRINGING UP IN OLD CUTTING.

On such natural reforestation of cut-over lands the future of the lumber supply largely depends.

Photo by Maine Forestry Dept.



Spruce and Fir Pulp Wood.

Photo by Maine Forestry Dept.

commodities has been our chief source of development and wealth. It is proper, therefore, that we should seek to insure a continuation of this harvest by still greater measures of protection, by economical utilization of waste and by reforesting by planting the idle acres within our boundaries.

Having sketched, I fear but roughly, the need of carefully husbanding our forest resources, let us now consider more particularly some of the measures necessary to ac-

complish this end. While the participants in the discussion of forest policies are far from agreeing on all points, the majority unite in accepting as truly essential to any forest policy the three following elements: fire protection, reforesting of waste areas and public ownership.

### Fire Protection

For many years the forestry department of Maine has realized the primary importance of fire protection for our timberlands, and



has given this branch of the service precedence over everything else. The greater part of our funds have been expended for the construction and maintenance of lookout towers, telephone lines and shelters for men and equipment; for the purchase of tools and supplies and for the compensation of chief wardens, lookout watchmen, patrolmen and inspectors. Also in certain years when extreme dry conditions prevail, large sums are spent for suppressing fires, as at such times quite an amount of assistance

from outside the department has to be secured for the actual fighting of fire.

Considering the character of our woodlands, the topography of our State and the conditions which we have to meet, I believe we may safely say that our present system of fire protection is based on sound principles. The efficiency of our lookout stations in locating fires has been thoroughly demonstrated. The idea of detecting forest fires from a lookout situated on the summit of a



LOOKOUT TOWER ON BLACK CAT MOUNTAIN.

This is one of the towers erected in the summer of 1919.

Photo by Maine Forestry Dept.

mountain originated among our Maine lumbermen in the days before the State concerned itself particularly with fire protection.

After three years of close observation of its workings I am satisfied that, with the one exception of which I will treat later, our Maine Forestry District Law can scarcely be improved. The incorporation by law of all the real wild lands of the State into an administrative district, which pays its own way in matters of fire protection by a special tax on the timberlands within its bounds, is a measure that has worked smoothly and effectively. By provision of this law the Forestry District is divided up into sub-districts each in charge of a Chief Warden appointed by the Forest Commissioner. As their assistants the Chief Wardens have deputy wardens, lookout men and, when necessary, patrolmen.

As a means of promoting still greater efficiency the Department has recently inaugurated a plan of calling the Chief Wardens together each year at Augusta for a general conference lasting two days. At the conferences these "Guardians of the Maine Forests" have been furnished with simple entertainment, have listened to addresses by prominent citizens and officials and have received instruction by experts regarding the installation and up-keep of telephones and also on other matters relating to their work. The men themselves assure me that they have been greatly benefited



BURNED LAND ON CHASE STREAM TOWNSHIP.

This fire was the largest in Maine during the summer of 1919, and burned over one hundred and twenty-five acres.

Photo by Maine Forestry Dept.



by these meetings and I feel sure that they have gone back to their districts better equipped for their duties.

It is particularly fortunate for the department that we have been able, with slight exception, to keep the same Chief Wardens commissioned year after year. Under the direction of the Forest Commissioner, they are the main stay of the Department, and each year of experience they gain in the handling of men in actual fire fighting and the prevention of fire, in tactful intercourse with the public in their respective districts, and in the methods of prevention and suppression of forest fires, renders them progressively more valuable to the service.

While treating of the personnel of the Department I will explain the exception noted above, relating to the Maine Forestry District Law, and this exception has to do with the limited wage allowed the Chief Wardens and the men under them. The law particularly states the following rates of compensation: For Chief Wardens three dollars per day with allowance for expense of travel and subsistence; for deputy wardens two dollars per day and expenses; for patrolmen and other assistants and for fire fighters twenty cents an hour—which amounts to two dollars per day for a ten hour day.

The forestry district law was enacted in 1909, and at that time the rates of compensation specified perhaps constituted a fair wage. But think what it would mean to-day to any employer if he were not allowed to bid more than twenty cents an hour for labor as strenuous as fire fighting, or were compelled to seek men of some executive ability, such as the Chief Warden service requires, but were not able to offer them more than three dollars per day. Only by some persuasion and a hint of the hope of better things to come have we been able to hold the class of men we require. In fact, it hardly would have been possible to keep our present efficient force together if there had not been, particularly on the part of the Chief Wardens, a certain conscientious loyalty to the Department.

To correct the unfortunate wage situation outlined above some immediate action is needed and I would suggest that at the next session of the Maine Legislature the Maine Forestry District Law be so amended that the Forest Commissioner can offer to the men in the fire protective service a fair compensation and proportionate to the work they perform. There is no economy in a low wage for responsible workers—it tends toward slackness, inefficiency and disorganization through a constant change of personnel.



GROWTH ON BURNED  
LAND.

Twenty-six year old growth  
of white birch and poplar on  
burned land.

Photo by Maine Forestry Dept.

While we speak more frequently of the lands in the Maine Forestry District, not by any means are all our timberlands confined within its boundaries. There is much valuable timber, both of soft wood and hardwood species, distributed throughout our organized townships outside the District; and in recent years the loss from woods fires in lands outside the District frequently has been greater than the fire loss in the timberlands lying within the District. The timber loss is not the only consideration in case of woods fires in the settled portions of the State, as other valuable property, such as cordwood, sawed lumber, fences, and sometimes even farm buildings are destroyed.

Ever since I became Forest Commissioner I have been trying for better protection for these lands outside the District. As organized towns they have their town officers who are charged with looking after their town affairs; but I have always felt that in matters of fire protection for timberlands, the Forest Commissioner, though not responsible, should cooperate with the local authorities and lend every assistance possible.

So the Department has kept in touch with each board of Selectmen by means of letters and circulars, has assisted in enforcing the slash law by keeping a slash inspector working in the lower part of the State, has furnished a considerable number of fire signs for posting, and, most important of all, has made a beginning in systematic

fire protection for organized lands outside the District by the erection of several lookout stations where the need is greatest. As Maine Forestry District money could not be used for these purposes outside the limits of the District, finances for these projects were secured from federal allotment for State aid, from special forestry funds and from private subscription.

In order to maintain the efficiency of our system of fire protection within the Maine Forestry District I already have made a recommendation for a change in the Forestry District Law which will allow this Department to offer a rate of compensation for employees that will average well with the wage offered in other fields of labor. I feel that this suggestion must meet with the approval of the owners whose lands are incorporated in the District, for it would seem that they will not deny these men, who are virtually their employees and working for the protection of their property, a wage at least equal to what men are receiving in the lumber camps. Neither do I anticipate from the land owners in the District any opposition to a proposal that the Maine Forestry District tax be increased another half mill. The funds now placed at the



BURNED LAND.

Showing how fire destroys young growth and undersized timber, making the land a waste for years. . .

Photo by Maine Forestry Dept.

disposal of the Department have been barely sufficient to carry on our present measures of fire protection, and if we raise the wages of our men to a fair standard, this additional expense, coupled with the increased expense of the necessary materials, supplies and equipment, will so cut into our District fund that we will be unable, on account of lack of finances, to carry on our work as we should. But any slacking up in our efforts for the protection of the District should not even be considered. Rather we should extend and improve our methods of protection by every agency we can devise. Even if the District tax is raised to two and one quarter mills, the landowners will not be paying for their fire protection an increase proportionate to the increase in the cost of every other kind of service.

How near we may come in the future to making our forests really fire proof is a matter for conjecture. Probably the menace of forest fires will persist as long as we have forests and natural conditions make them highly inflammable at times. Lightning, spontaneous combustion and inevitable accident will doubtless continue to set fires in the wilderness as well as in the village and city. As a nation we are notorious for the amount of valuable property that we convert into cinders and smoke each year, and the greater part of this loss arises simply from lack of care and precaution.

I am convinced, however, that the damage we suffer from forest fires set by human agency is really caused by the carelessness of a very small proportion of our public. Of the thousands of individuals who pass through our forests and woodlands each day during the danger season, if even one in a thousand were habitually careless with fire we would hardly have a green acre left after a dry period of a week's duration. But the measure of carelessness and indifference exhibited by this very small per cent. is truly amazing. Sometimes in burning brush and clearing land, fire is allowed to smoulder in debris or stump for days till a brisk wind begins to scatter sparks broadcast. Men engaged in lumbering and doubtless claiming some measure of woodcraft as a part of their business, sometimes neglect to extinguish their luncheon fires. Fishermen, passing along a stream, have been known to throw lighted matches and burning tobacco into the litter behind them, instead of into the water at their feet. Our records show that fires are set each season by just such careless practices, and not a small part of the activities of the Forestry Department is concerned with combating indifference and carelessness by educational methods.



#### HARDWOOD OPERATION.

A four-horse load of hardwood logs en route to the landing. There is increasing demand for the hardwoods and in some sections within easy hauling distance of the railroads, or of waters where rafting operations can be safely carried on, considerable amounts of hardwood logs are being cut. Photo by Maine Forestry Dept.



#### HARDWOOD OPERATION.

Building a hardwood raft behind a breakwater erected to keep the swift current of the river from hindering the work. Photo by Maine Forestry Dept.



Through education and publicity we have made great progress for fire prevention. Not only our fire signs distributed through the forests help mould public sentiment toward protective practices, but there are other agencies that render great assistance. Our wardens and other employees in the woods naturally talk fire protection most of the time and make good missionaries for prevention. Our lookout towers from their high elevation easily become landmarks and serve as constant reminders of the danger of fire and the need for prevention. Practically all the publications issued from this Department deal with forest protection and most of them relate particularly to fire protection, and these publications are given a wide circulation in our State. And finally, but not least, the aid freely given by a friendly press, through the publication as news items of matter relating to the activities of the department, helps constantly to keep fire protection before the public. All these agencies serve as means of publicity and have an important bearing on fire prevention and the protection of our timberlands.

### **Reforestation**

"Few that fell trees plant them", is the terse statement made a number of years ago by a keen observer of forest conditions. But the present depleted condition of our forests leads us to believe that those who fell trees must begin to plant them, if they would have trees to fell in the future.

Maintenance of a timber supply in Maine is of the utmost importance. With millions of dollars invested in wood-using plants, such as our pulp and paper mills, if these mills are to continue in business we must endeavor to establish a future supply on a permanent basis. Fortunately some of our manufacturing interests own or control considerable tracts of timberland and of cut-over lands on which young trees are growing, and for these fortunate ones the crisis in raw material may be delayed for twenty-five or even fifty years. But any large consumer of wood not backed by a considerable reserve of timber land may well view the future with uncertainty, unless he is content eventually to scrap his plant or turn it to some other line of production.

If we sought to follow out the instructions of authorities on forestry matters, before attempting reforestation we must needs make a classification of our lands. Certainly it might be considered poor policy to plant with trees areas well suited and needed for agricultural purposes. Doubtless if such a classification were





### **HARDWOOD OPERATION.**

Raft of hardwood with its one man crew, on its way down river. The motive power is the current of the stream. A sort of control is maintained by vigorous use of the long sweep at the rear.

Photo by Maine Forestry Dept.



### **HARDWOOD OPERATION.**

Breaking up the hardwood raft and hauling the logs ashore with donkey engine.

Photo by Maine Forestry Dept.

undertaken we would find among our woodlands and waste lands limited areas adapted to agriculture. But the fact that so much fertile land in Maine, once cleared for farms, has been abandoned in the last twenty-five years would seem to point to the conclusion that in our State, if we should classify our lands and reserve for agriculture all the suitable areas, these areas, whether large or small, would not be in demand for a long time to come.

But allowing that farming is due in the future to develop considerably and to take up a much larger area than it now occupies, we know that we will yet have a large territory for which we can find no better purpose than to continue to grow trees, and many acres of waste land to which a timber crop is more suited than any other kind of crop.

The problem then before us is to reforest by planting such portions of these lands as are not making satisfactory progress toward reforesting themselves. The magnitude of the task is thoroughly appreciated, and it is not to be expected that any great progress would be made in a year or even in ten years; but the pressing need is to make a substantial start in planting and to keep adding to our planted areas year after year an ever increasing acreage of young forest trees.

Both for any program of restocking that the State may choose to undertake for itself, or for co-operation with private owners in reforesting their own lands, it is necessary to produce in large quantities young trees for planting. This leads me to recommend that the next Legislature make provision for establishing one or more State forest nurseries in addition to the one we now have. Our State forest nursery at Orono was instituted primarily to supplement the course of instruction in forestry at the State College. In addition to serving splendidly in training our young foresters in nursery practices, it also has furnished at a very reasonable cost a considerable amount of planting stock for distribution to private owners throughout the State.

The fact that for the last few seasons the demand from private owners for young soft wood trees to plant has been very much greater than any possible output of this nursery goes to show that in Maine we are already awakening to the need of reforestation, and that our land owners are willing to begin to plant trees if they can secure the planting stock.

In order to meet this increasing demand for planting stock the State should establish a new forest nursery so that we may have an adequate supply of young trees for distribution at cost. An



### LUMBERMEN'S FARM IN THE DEEP WOODS.

When carried on in connection with lumbering operations such a farm proves a real profit maker. Advantages—farm produce for the camps at cost, of better quality and without excessive transportation charges by rail or tote team; opportunity to make use of the fertilizer that is usually wasted around the hovels; a chance to give a few good men an all-the-year job, farming in summer and lumber in winter, resulting in better labor conditions.

Photo by Maine Forestry Dept.



Potato Field on a Lumbermen's Farm.

Photo by Maine Forestry Dept.

appropriation of ten thousand dollars, five thousand dollars to be available in 1921 and the balance in 1922, would be ample for immediate needs. In acquiring a suitable location for this new nursery we should bear in mind that the demand for planting stock will surely increase and a sufficient area of land should be secured to allow of a much larger development in the future. A new State nursery must soon become self supporting through the sale of its products, and then it becomes simply a business proposition that maintains itself. The State nursery at Orono now has an income from sales sufficient to pay all expense of maintenance.

While some advocates of tree planting believe that young forest trees should be furnished free to any who will plant and properly care for them, at present it is quite a privilege to be able to secure them at cost. With the present nation-wide interest in planting and restocking of timberlands there is prospect of such a request for young trees to plant that every source of production of nursery stock must be severely taxed to meet the demand.

### Public Ownership

When considering forest conservation we are apt to think primarily of protecting our forest resources for the purely commercial reason that we may have raw material for our mills. But we must also realize that the forests minister to us in many other ways that have a very direct relation to public comfort and health.



Shot (with the camera) at Sunrise.

Photo from J. K. Pooler

We should not forget that our forests serve as a never ending source of clean, potable water; that they are closely affiliated with stream flow, favorable climatic conditions and rain fall; and, of no little consequence, that they harbor and sustain a variety of wild life which constitutes in itself a great natural resource. Also we must consider the importance of our forests as a means of recreation and health. The value of even a brief sojourn in the big woods as a cure for many of the minor ills provoked by a feverish, steam-heated civilization is too well known to need appraisal in these pages. It seems to be the privilege of the forests even to doctor the doctors, as I notice that none come oftener to the woods for rest and health than the medical men themselves.

It would seem, therefore, that the forests are indispensable to the public welfare, and that the public may well take such measures as will assure that they are maintained. While it is probable that many private owners, for their own interests, will take steps to reforest their lands, it is only right that the public should lead the way in matters of conservation and forest renewal. Thousands of acres of cut-over lands and of waste lands are being purchased for public administration by other



On Baker Stream, Tp. 5, R. 6.

Photo by Maine Forestry Dept.





MOUNT KATAHDIN.

One of Maine's beauty spots that may be included in a State Forest Reserve.

Photo by Florence H. Colby.

states. In order that the State of Maine may acquire by purchase tracts of land suitable for reforestation I would recommend that for 1921 and 1922 the appropriation for general forestry purposes be increased to twenty thousand dollars for each year, the money thus appropriated to constitute a permanent fund and any unexpended balance in any one year to be available in future years. Not all of this sum would be devoted to the purchase of lands, as there are certain other expenditures for

general forestry purposes that draw from this fund. But the greater part of the appropriation would be available for buying land and for reforestation and improvement of any lands that may be acquired. Public ownership of timberlands should be a popular measure with the citizens of Maine, and from a comparatively small beginning we may hope to see developed a broad and permanent policy of acquiring lands for the State.



### A Forest Policy For Maine.

If the State of Maine will protect the forests within her borders from fire, will carry on a progressive plan for State ownership of lands suitable for reforestation and improvement, will encourage the planting of trees by private owners and improve and reforest such tracts as may be secured in the future for public ownership, it would seem that in these three fundamental principles—protection, public ownership and reforestation—we have a forest policy for Maine that is adequate for the present. For a beginning I would rather see these three basic principles diligently applied, than to undertake a forestry program with more complicated, and,



#### WASTE IN LUMBERING.

Brow log on yard, a fine stick of spruce with owner's mark and scaler's check mark, left to rot in the woods.

Photo by Maine Forestry Dept.

in a way, experimental details which might serve perhaps to distract from the main issue, namely: to stop wasting what we have and to add what we can to our forest resources.

There are many other valuable measures of forest protection which we may hope to grow up to and develop in time. We have to admit that our present system of taxation invites the stripping of our land, that the accumulation of slash from lumbering makes fire protection more difficult and that indiscriminate cutting of all

sizes, without leaving even a tree for seed, is radically wrong. But if all the methods that might work for better forest conditions were made mandatory at one stroke, the business of lumbering and the allied manufacturing industries would be reduced to a condition bordering on confusion.

At this period of labor shortage and other unfavorable situations, when it is a problem how to get enough lumber cut and delivered to the mills to keep the wheels turning, it does not seem best that we try to adopt forestry all at once. That we will continue to progress I am fully assured. Self interest alone on the part of our private owners will gradually induce them to practice forestry for themselves, and this tendency toward voluntary improvement will grow as we learn to consider our forests not as a mine to be exhausted and abandoned, but as a crop to be cultivated and produced. One particular method by which the private owner can favor his land is through requiring of his operators more respect for the young growth that is so liable to damage or destruction in the process of lumbering. The young soft wood trees that have proved their dominance by struggling up through brush and sprouts are worth dollars, and their development toward a future crop is far ahead of anything we may accomplish by the planting of tiny seedlings.



Logs in Indian Pond, East Branch of the Kennebec.

Photo by Maine Forestry Dept.

I am inclined to believe that lumber is bound to continue both scarce and high priced, and in a way this condition will work for better forest management, as a high price for lumber will have a marked tendency toward the elimination of waste and on account of the increased value of stumpage the owners of timberland can better afford to spend more for protection and for restocking of their holdings.

The financing of any measures for the protection and improvement of our forest resources, either by the Maine Forestry District or from public funds, should not be considered as an expense, but rather as an investment; for we will be repaid once and again through the manifold benefits and comforts that only the forests can supply. The maintenance of a forest policy embracing protection reforestation and public ownership will assuredly contribute to the wealth and welfare of every one of us.

### **Budworm Damage In Maine.**

The damage being done to our forests by the spruce budworm first attracted my attention in the spring of 1911 on Parlin Pond Township in Somerset County. By the end of the summer of 1912 the spread of the budworm, as evidenced by the brick-red color of the foliage of the dead and dying trees, was very noticeable and began to cause some concern in the minds of the Kennebec lumbermen. In the infested areas at certain seasons the air was filled with the small, light colored moths, the final development of the worm, and it seems only natural that they should be blown about and spread over new territory by the wind, like an unchecked forest fire.

By the fall of 1913 the budworm was widely established in the northern part of the Kennebec watershed, and in 1914 and 1915 the infested territory included townships to the north and east of Moosehead Lake. In the next three seasons this blighting insect hoard spread rapidly to the north, south and east. It overran the Allagash regions, invaded the valleys of both branches of the Penobscot River and the Katahdin district and extended down into Hancock and Washington Counties. The greatest amount of damage probably occurred in the summers of 1917 and 1918; and in this latter year the budworm visitation seemingly came to an end. They did not dwindle away. They simply vanished in a season.

So the budworm apparently has come and gone; but as a result of his reign in our forests we have wide areas where prac-



#### BUDWORM DAMAGE.

Young Spruce and Fir  
Killed by the Spruce Bud-  
worm.

Photo by Maine Forestry Dept.

tically every fir tree is dead. Also in certain localities quite a percentage of the spruce either has been killed or so badly damaged that it must eventually die. The greatest damage apparently occurred where the young growth consisted principally of fir. The budworm seemed to concentrate to such an extent in these thick fir stands that old growth, mature trees were virtually stripped in a year, and spruce trees in the vicinity of these heaviest outbreaks suffered almost as much as the fir.

At the request of the Department the Chief Wardens reported on the budworm damage in their respective districts. From these reports and from my own observations I would estimate that at least one-third of the fir in the State of Maine has been killed by this insect. In the worst affected areas perhaps ten percent of the spruce has suffered with the fir. Entomologists tell us that Maine was visited years ago by the budworm and that other visitations are liable to occur in the future. But some think the present invasion was invited by the dense growth of young fir that was common in many localities. This young fir growth had sprung up during the last thirty or forty years in old clearings and following heavy cut-

tings in thick spruce stands. The theory is that with such a bounteous supply of green and thrifty young fir available for food, the budworm family waxed particularly strong and numerous and overran the woods before the natural parasites and other enemies of the species could put a check on them. Just what brings such an insect invasion to a sudden end is hard to determine; but we may indeed be thankful that this plague has apparently run its course.

Those who make a study of such matters and are wise in the ways of insects, state with conviction that insects are the greatest enemy that man has to fear. They claim that if all checks were removed from insect life all living things on the face of the earth must perish within three years. First, all vegetation would be devoured and then all animal life, including mankind, would succumb to famine. That this could be true we may well believe when we consider how helpless man is against the countless hordes of insects, with their prodigious power of multiplying themselves.

With poison sprays and sticky paper we may account for a few bugs and flies; but we would soon be overcome without the aid of our many vigilant little allies—the insect hunting birds and many of the smaller animals and reptiles. So we may well give every protection and support to these busy little helpers that render such great assistance in keeping this insect peril in check, if we would further our own interests in saving not only our forests, but also our farm crops, from substantial injury.





## SUMMARY OF RECOMMENDATIONS.

- (1) That a change be made in the provision of the Maine Forestry District law relating to compensation of chief wardens and assistants.
  - (2) That an additional half mill be added to the Maine Forestry District tax.
  - (3) That the appropriation for General Forestry Purposes be increased to twenty thousand dollars for each year; part of this sum to be used in the purchase of land suitable for improvement and reforestation.
  - (4) That an appropriation of five thousand dollars for 1921 and a like sum for 1922 be made for the purpose of establishing a new State Forest Nursery.
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Fire Protection

Maine Forestry District

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FIN BOOM ON THE KENNEBEC NEAR BINGHAM, MAINE.

The comparatively recent introduction of the fin boom has quite revolutionized log driving on some rivers. The picture illustrates how the set of the current against the fins forces the boom far to the right, almost to the opposite bank of the river. Thus the boom guides the floating logs to the right, past the head of the island just visible in the middle distance and down the right hand channel of the river.

Photo by Maine Forestry Dept.

# MAINE FORESTRY DISTRICT

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## FIRE SEASON



**T**HE Maine Forestry District, in the past year, experienced one of the most dangerously dry seasons since its establishment in 1909. The rainfall was below normal; no general rains and only very few light showers. Early in the season the brooks became low, later some of them going dry. Also the fishermen and woods travelers were very numerous.

The lookout stations opened earlier than usual. Lead Mt., in Hancock County, was opened April 14th, and the first fire of the season was discovered by this station on April 20th. By the first of May practically all

the Watchmen and Patrolmen were on duty and had to be kept on duty until September 15th, when we were favored with a general rain all over the State. A notable fact for 1919 is that Washington and Hancock Counties, which in the past have always been very unfortunate with forest fires, had no fires of any consequence this season. The territory between Millinocket and Ashland, supervised by John E. Mitchell of Patten, Thomas Griffin of Millinocket and Charles L. Weeks of Ashland, three Chief Forest Fire Wardens, proved to be the most dangerous section for forest fires in the Maine Forestry District. The particular reason for this we believe is that there were more lumbermen and sportsmen in the woods in that particular section than in any other part of the State.



### BURNED LAND.

A condition all too common in the United States—a railroad track, bounded on both sides by burned land, stretching away into the distance as far as the eye can see.

Photo by Maine Forestry Dept.



### BURNED LAND.

After ten years the reproduction here is nothing but fireweed and cherry bushes. Reforesting by planting is necessary if this land is ever again to acquire value as timberland.

Photo by Maine Forestry Dept.



## FOREST FIRES REPORTED BY LOOKOUT STATIONS

NO.	STATION NAME	LOCATION OF STATION	NO. FIRES
1.	Lead Mt. ....	Twp. 28, Hancock Co. ....	8
2.	Pl. Pond Mt. ....	Caratunk Pl. ....	1
3.	Sally Mt. ....	Attean Twp. ....	0
4.	Tumbledown Mt. ....	Twp. 5, R. 6, W. K. R. ....	1
5.	Squaw Mt. ....	Twp. 2, R. 6, E. K. R. ....	10
6.	Snow Mt. ....	Twp. 2, R. 5, Franklin Co. ....	1
7.	Bigelow Mt. ....	Dead River Pl., Somerset Co. ....	6
8.	White Cap Mt. ....	Twp. 7, R. 10, N. W. P. ....	5
9.	Spencer Mt. ....	Middlesex Grant, Piscataquis Co. ....	2
10.	Rocky Mt. ....	Twp. 18, R. 12, W. E. L. S. ....	10
11.	Center Mt. ....	Twp. 4, R. 10, W. E. L. S. ....	0
12.	Otter Lake Mt. ....	Twp. 3, R. 4, W. E. L. S. ....	15
13.	Mt. Chase ....	Chase Twp. ....	6
14.	Ragged Mt. ....	No. 4, Indian Purchase ....	10
15.	Kineo Mt. ....	Moosehead Lake ....	5
16.	Coburn Mt. ....	Twp. 3, R. 6, B. K. P., W. K. R. ....	2
17.	Wesley Mt. ....	Wesley, Washington Co. ....	3
18.	Depot Mt. ....	Twp. 14, R. 16, W. E. L. S. ....	2
19.	Soper Mt. ....	Twp. 18, R. 12, W. E. L. S. ....	0
20.	Round Mt. ....	Twp. 11, R. 8, W. E. L. S. ....	11
21.	Aziscoos Mt. ....	Lincoln Pl., Oxford Co. ....	1
22.	Katahdin Mt. ....	Twp. 3, R. 9, W. E. L. S. ....	1
23.	Moxie Bald Mt. ....	Twp. 2, R. 3, E. K. R. ....	2
24.	Kibbie Mt. ....	Twp. 1, R. 7, W. B. K. P. ....	0
25.	Priestly Mt. ....	Twp. 10, R. 13, W. E. L. S. ....	1
26.	Boundary Bald Mt. .	Twp. 4, R. 3, N. B. K. P. ....	1
27.	Williams Mt. ....	Twp. 2, R. 7, B. K. P., W. K. R. ....	0
28.	West Kennebago Mt.	Twp. 4, R. 4, W. B. K. P. ....	11
29.	No. 4 Mt. ....	Twp. A, R. 14, W. E. L. S. ....	2
30.	Pocomoonshine Mt. .	Princeton, Washington Co. ....	5
31.	Passadumkeag Mt. .	Grand Falls Pl. ....	4
32.	Tug Mt. ....	Twp. 30, M. D. Washington Co. ....	0
33.	Beetle Mt. ....	Twp. 7, R. 10, W. E. L. S. ....	2
34.	Horse Mt. ....	Twp. 6, R. 8, W. E. L. S. ....	4
35.	Boarstone Mt. ....	Elliottsville Pl. ....	15
36.	Jo. Mary Mt. ....	Twp. A, R. 10 ....	1
37.	Cooper Mt. ....	Cooper, Washington Co. ....	10
38.	Musquash Mt. ....	Topsfield ....	0
39.	Green Mt. ....	Twp. 4, R. 18, W. E. L. S. ....	0
40.	Muscalsea Mt. ....	Twp. 5, R. 16, W. E. L. S. ....	5
41.	Saddleback Mt. ....	Twp. 2, R. 1, W. B. K. P. ....	13
42.	Doubletop Mt. ....	Twp. 4, R. 10, W. E. L. S. ....	3
43.	Nulhedus Mt. ....	Twp. 5, R. 17, W. E. L. S. ....	0
44.	Lawler Hill ....	Benedicta ....	0
45.	Norway Bluff ....	Twp. 9, R. 9, W. E. L. S. ....	13
46.	No. 9 Mt. ....	Twp. D, R. 2, W. E. L. S. ....	1
47.	Hedgehog Mt. ....	Twp. 15, R. 6, W. E. L. S. ....	8

48. Three Brooks Mt. . .	Twp. 15, R. 6, W. E. L. S. . . . . .	0
49. Speckles Mt. . . . .	Grafton, Oxford Co. . . . .	1
50. Spoon Mt. . . . .	Twp. 8, R. 7, W. E. L. S. . . . .	3
51. Mattamiscontis Mt. .	Twp. 3, R. 9, N. W. P. . . . .	7
52. Squapan Mt. . . . .	Twp. 11, R. 4, W. E. L. S. . . . .	24
53. Schoodic Mt. . . . .	Twp. 9, Hancock Co. . . . .	2
54. Hardwood Mt. . . . .	Twp. 9, R. 18, W. E. L. S. . . . .	0
55. Almanac Mt. . . . .	Lakeville Pl. . . . .	0
56. Allagash Mt. . . . .	Twp. 7, R. 14, W. E. L. S. . . . .	2
57. Picket Mt. . . . .	Lang Pl. . . . .	0
58. Flagstaff Mt. . . . .	Twp. 3, R. 4, B. K. P., W. K. R. . . . .	0
59. Pogey Mt. . . . .	Twp. 4, R. 9, W. E. L. S. . . . .	0
60. Washington Bald Mt.	Twp. 42, M. D. . . . .	0
61. Mitchell Mt. . . . .	Haynesville . . . . .	5
62. Soubungo Mt. . . . .	Twp. 4, R. 11, W. E. L. S. . . . .	3
63. Black Cat Mt. . . . .	Twp. 1, R. 9, W. E. L. S. . . . .	8
64. De Boullie Mt. . . . .	Twp. 15, R. 9, W. E. L. S. . . . .	1

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FOREST FIRES REPORTED BY PATROLMEN

PATROLMAN	TERRITORY	COUNTY	TOTAL NO. FIRES
Richard Witham	Twp. 12, R. 17	Aroostook	1
Robert J. Walsh	Twp. 10, R. 4	Aroostook	1
Joseph Labby	Twp. 11, R. 6	Aroostook	2
Jos. J. Albert	Twp. 17, R. 3, 4, 5	Aroostook	3
E. K. Peck	Twp. 7, R. 3	Aroostook	1
Andrew Sawyer	Twp. 9, R. 7	Aroostook	1
Geo. M. Austin	Twp. 16, R. 4;		
	17, R. 4	Aroostook	2
Otto Hede	Twp. 16, R. 5		
	17, R. 5	Aroostook	2
John Webber	Twp. D. R. 2	Aroostook	3
James Smart	Twp. 16, R. 5 & 6	Aroostook	1
Frank McMannus	Twp. 5, R. 5		
	8, R. 6		
	8, R. 9	Aroostook	2
H. E. Huson	Twp. 10, R. 3	Aroostook	1
			20
M. W. Toothaker	Dallas	Franklin	2
John H. Martin	Twp. 3, R. 1	Franklin	5
			7
Chas. Goggins	Letter D	Oxford	1
			1
Herbert Tinker	Twp. 8, R. 14	Penobscot	1
Jos. A. Lebel	Twp. 6, R. 7 & 8		
	7, R. 8	Penobscot	2

W. F. Harnden	Twp. 7, R. 7			
	8, R. 7	Penobscot	1	
				4
E. J. Grant	Twp. 5, R. 14	Piscataquis	2	
Leon E. Potter	Twp. 1, R. 10	Piscataquis	1	
				3
				35

FEDERAL COÖPERATION

The coöperation of the United States Forest Service was continued under the agreement which was signed in 1916. On account of the State of California qualifying for coöperation under the Weeks Law, together with the fact that Congress failed to increase the so-called Weeks Law appropriation, our allotment for 1919 has been somewhat smaller than in previous years. The following tabulation will show the amount of money received from the U. S. Forest Service and the amount expended by this department under the different headings:

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

Report of Expenditures on Watersheds of Navigable Streams. State of Maine—Season of 1919.

KIND OF EXPENDITURE	STATE		FEDERAL	
	Number	Amount of expenditure (salaries, travel and other charges)	Number	Amount of expenditure (salaries only)
State or Federal:				
Collaborator.....	—		1	\$12.00
Lookout Watchmen.....	42	\$16,275.78	22	5,715.00
Patrolmen.....	75	19,527.90	—	
State only:				
Firewardens, rangers, etc.....	38	19,304.41	—	
Fire fighting.....	—	6,397.69	—	
Construction work, (lookouts, telephone lines, etc.).....	—	49,687.01	—	
Administration charges.....	—	4,212.76	—	
Miscellaneous charges.....	—	2,378.46	—	
Total for the year.....		\$117,784.01		\$5,727.00

FEDERAL LOOKOUT STATIONS

As in previous years, the Federal allotment was confined entirely to the Lookout Stations named below:

STATIONS	NUMBER	WATCHMAN
Squapan Mt.	52	J. M. Potter
Three Brooks Mt.	48	J. M. Donahue
Hedgehog Mt.	47	Herbert E. Brown
Mt. Chase	13	Warren Darling
Coburn Mt.	16	P. J. Walsh

Kineo Mt.	15	Alice Henderson
Mattamiscontis Mt.	51	John Stanchfield
Ragged Mt.	14	George H. Monroe
Boarstone Mt.	35	T. H. Katen
Squaw Mt.	5	C. H. Leland
Attean Mt.	3	Allen Runnells
Boundary Bald	26	Ed. Goslin
Bald Mt.	23	Richard Morris
Bigelow Mt.	7	Lewis F. Marsh
West Kennebago Mt.	28	Wallace Houston
Musquash Mt.	38	Warren A. Bailey
Lead Mt.	1	Hiram Corliss
Pocamoonshine Mt.	33	Merle E. Hoar
Wesley Mt.	17	S. M. Hawkins
Cooper Mt.	37	Oscar Sadler
Schoodic Mt.	53	Howard L. Webb



A Mountain Laid Waste by Forest Fire.

Photo by C. W. Grover.

## COÖPERATION WITH THE STATE OF NEW HAMPSHIRE

As in previous years, the watchmen of the Maine Forestry District were furnished with a list of watchmen and wardens in New Hampshire, including their post office address and telephone connection. They were instructed to be on the lookout for fires across the State boundary, and, should a fire be discovered, to get into communication with the watchmen and wardens in that territory.

Patrolmen on the Magalloway River, the Valley of Big Meadows and Hammond Brooks were employed and paid jointly by the Maine Forestry District and New Hampshire Timberland Owners' Association.

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COÖPERATION WITH THE RAILROADS

The section foremen of the different railroads in the State, whose divisions are in the Maine Forestry District, were commissioned as Deputy Forest Fire Wardens. These men were called upon many times this summer to put out fires. We find in the tabulation of forest fires in 1919 that only nine fires were caused directly by the different railroads. We believe that this is a good showing made by the railroads in protecting the forests along their lines from fire.

## SLASH

Early in the spring letters were written to all the Chief Forest Fire Wardens, instructing them to take care of all slash in their respective territories, and we are informed by these men that in all cases where slash was left along side the road, contrary to the law, it was taken care of, either by the owner of the land or the operator. Letters also were written to the County Commissioners and Road Commissioners in regard to slash left along side the roads in the District.

## SUPERVISION

Mr. Edwin I. Small, experienced woodsman and once employed by this department as foreman of the construction crew, in putting up towers and camps, was appointed Inspector for the season of 1919. We are glad to report that more stations were inspected this year than in any other year since the establishment of the Maine Forestry District. Out of the sixty-four lookout stations in the District, fifty were thoroughly inspected by Mr. Small. On receipt of his reports in this office a copy was sent to each Chief Warden, with instructions to comply with the recommendations as closely as possible.

## FOREST FIRES

According to our records, 292 forest fires were reported to this office by our Watchmen and Patrolmen during the past season. The services of outside help, besides our regular force, were required on 86 fires, which are listed in the tabulation below. The largest forest fire of the season occurred May 31st on what is called Chase Stream Township, Somerset County, and this was about the most expensive fire.



TOWNSHIP.	Date	Acres	Cause	Damage
Twp. 15, Range 4, Aroostook Co...	July 4	150	Burning Brush	\$300.00
Twp. 2, Range 3, " "	May 16	5	Cigarette	50.00
Twp. D, Range 2, " "	May 15	20	Burning stumps	100.00
Twp. 11, Range 4, " "	May 14	12	Burning brush	*
Twp. 3, Range 4, " "	May 14	10	Campers	1000.00
Twp. 10, Range 3, " "	June 3	2 1/2	Unknown	*
Twp. 12, Range 6, " "	June 9	12	Woodsmen	360.00
Twp. 11, Range 6, " "	July 1	2	Fishermen	15.00
Twp. 12, Range 13, " "	July 1	100	Cigarette	*
Twp. 8, Range 4, " "	June 25	50	Campers	75.00
Twp. 14, Range 7, " "	June 26	2	Campers	*
Twp. 20, R. 11 & 12, " "	June 19	20	Canadian farmers	*
Twp. 9, Range 7, " "	June 21	4	Unknown	15.00
Twp. 11, Range 8, " "	July 4	100	Fishermen	500.00
Twp. 8, Range 4, " "	July 5	1/2	Campers	*
Twp. 12, Range 17, " "	June 24	3	Canadian farmers	*
Twp. 9, Range 17, " "	June 21	4	Unknown	15.00
Twp. 10, Range 6, " "	July 21	4	Cigarette	900.00
Twp. 9, Range 7, " "	Aug. 13	1/2	Unknown	20.00
Twp. 12, Range 9, " "	Aug. 16	1/2	Lightning	10.00
Glenwood Pl., " "	Aug. 18	1	Campers	10.00
Jerusalem, Franklin Co.	Apr. 23	10	Engine	*
Jerusalem, " "	Apr. 23	1	Engine	5.00
Jerusalem, " "	May 14	12	Engine	*
Jerusalem, " "	May 15	15	Fishermen	75.00
Letter D, " "	May 14	20	Engine	*
Dallas Pl., " "	May 30	1/2	Engine	*
Redington, " "	June 3	2	Pulp cutters	100.00
Twp. 3, Range 1, " "	June 4	2	Lightning	5.00
Twp. 3, Range 4, " "	June 5	10	Fishermen	*
Twp. 10, S. D., Hancock Co.	May 16	1500	Fishermen	*
Twp. 8, S. D., " "	May 10	20	Unknown	30.00
Twp. 8, S. D., " "	April 28	12	Unknown	30.00
Twp. 16, S. D., " "	May 16	1500	Fishermen	1000.00
Twp. 8, S. D., " "	May 31	25	Fishermen	50.00
Twp. 10, S. D., " "	June 1	40	Blueberry pickers	*
Twp. 33, M. D., " "	May 22	2	Fishermen	6.50
Twp. 8, S. D., " "	June 1	15	Unknown	*
Twp. 28, M. D., " "	June 25	2 1/2	Unknown	100.00
No. 21 Pl., " "	June 23	5	Unknown	100.00
Twp. 4, Range 3, Oxford Co.	May 31		Engine	*
Twp. 4, Range 5, " "	June 11	1	Fishermen	*
Adamstown, " "	Aug. 1	1/10	Lightning	*
Twp. 4, Range 3, " "	Aug. 8	30 sq. ft.	Fishermen	*
Andover West Surplus, " "	Aug. 5	1/10	Unknown	*
Twp. 3, Range 7, Penobscot Co.	July 3	1/4	Fishermen	*
Indian No. 3, " "	May 16		Unknown	*
Drew Pl., " "	May 14	9	Fishermen	*
Twp. 6, Range 7, " "	May 21	1/2	Drivers	*
Twp. 1, Range 8, " "	June 6	3	Matches	*
Twp. 2, Range 8, " "	June 26	300	Matches	*
Twp. A, Range 7, " "	July 27	1/8	Unknown	*
Twp. 2, Range 8, " "	Aug. 2	75	Lightning	*
Twp. A, Range 7, " "	Aug. 13	1/4	Berry pickers	*
Twp. 6, Range 8, " "	Aug. 12	16	Berry pickers	*
Indian No. 3, " "	Sept. 29	14	Unknown	*
Twp. 7, Range 14, Piscataquis Co.	Aug. 22			*
Elliottsville Pl., " "	May 1	2	Accidental	30.00
Twp. Big Squaw, " "	May 30	2	Engine	20.00
Twp. 1, Range 9, " "	June 3	1/4	Lightning	*
Twp. 2, Range 10, " "	June 13	15	Unknown	50.00
Twp. 5, Range 10, " "	July 1	1 6/10	Campers	328.00
Twp. 1, Range 9, " "	Sept. 17			*
Twp. 5, Range 10, " "	May 14	11	Woodsmen	*
Twp. 5, Range 10, " "	Sept. 22	2	Unknown	80.00
Long Pond Pl., Somerset Co.	May 14	2	Burning brush	*
Chase Stream, " "	May 13	75	Engine	*
Chase Stream, " "	May 31	125	Fishermen	900.00
Twp. 5, Range 16, " "	June 3	2	Lightning	*
Spaulding Town, " "	June 29	1	Fishermen	10.00
Twp. 4, Range 5, " "	June 6	2 sq. rods	Lightning	*
Twp. 4, Range 7, " "	Sept. 5	6	Woodsmen	36.00
Beddington, Washington Co.	April 20	50	Unknown	*
Twp. No. 32, M. D., " "	May 19	50	Unknown	100.00
Grand Lake Str. Pl., " "	May 23	3	Unknown	10.00
Twp. 30, M. D., " "	May 9	35	Woodsmen	*
Plan. No. 21, " "	June 26	2	Campers	75.00
Twp. 10, Range 3, " "	June 2	2	Engine	80.00
Twp. 10, Range 3, " "	June 4		Fishermen	*
Twp. 5, " "	July 5	1/4		15.00
		4429		\$6,605.50

\*Not mentioned.



Woods Engineering—Dam Built by Lumbermen.

Photo by Maine Forestry Dept.



Woods Engineering—Dam Built by Beaver

Photo by Maine Forestry Dept.

SUMMARY OF FOREST FIRES 1919 IN MAINE FORESTRY DISTRICT.

COUNTY.	Acreage.	Damage.
Aroostook.....	503	\$3370.00
Franklin.....	72 <sup>1</sup> / <sub>2</sub>	185.00
Hancock.....	3121 <sup>1</sup> / <sub>2</sub>	1316.50
Penobscot.....	418	
Piscataquis.....	33	508.00
Oxford.....	1	
Somerset.....	211	946.00
Washington.....	142	280.00
	4502	\$6605.50

Causes of Fires: Lightning, 8; railroad, 9; unknown, 21; lumbering, 4; brush burning, 7; campers, 37; total, 86.

CAUSES OF FOREST FIRES ARE CLASSIFIED UNDER THE FOLLOWING SIX HEADINGS

LIGHTNING: Fires the origin of which is directly traceable to lightning.

RAILROADS: Fires incidental to the construction, operation or maintenance of common carrier railroads. (This includes fires from sparks or cinders from all locomotive or construction engines; from lighted cigars, etc., thrown from car windows; from the clearing of rights of way, or from the individual carelessness of any employee or passenger.)

LUMBERING: Fires incidental to all lumbering operations. (This includes fires caused by sawmills or donkey engines and logging railroad locomotives, except on such logging railroads as are common carriers; and by the carelessness of all lumbering employees.

BRUSH BURNING: Fires caused by clearing lands for any purpose (other than for rights of way for common carrier railroads, and brush burning in lumbering operations,) or by rubbish, garbage, range, stubble or meadow burning, and by burning out animals, insects or reptiles.

CAMPERS: Fires resulting in any manner from carelessness of campers, stockmen, prospectors, picnickers, surveyors, berry pickers, hunters, fishermen, automobilists, tramps and other travelers through the forest.

UNKNOWN: All fires the origin of which cannot be determined with such degree of certainty as would justify their inclusion under any other head.

## EDUCATIONAL WORK

It is the belief of this department that the greatest need at the present time in this State is the education of the five per cent of the population which does not use care and intelligence in its treatment of the woods. The greater portion of the citizens of Maine, and most sportsmen from without the State are now very careful. There remains that smaller per cent that always cause trouble, and these people the department is trying every year, and especially this year, to reach by putting out posters and other publicity matter. The posters put out this year are mostly metal signs tacked on trees or hung above roads. During this past season pamphlets have been distributed in practically all of the public places in the State. The Kennebec Valley Protective Association has helped us a great deal in this particular work with their effective posters and other publicity material.



SUMMER COTTAGES IN THE MAINE WOODS.

If cottagers have a proper respect for the forest and are careful of fire their presence is an advantage to the State. A cottage community makes good market for produce from nearby farms. Also summer residents hold millions of dollars in valuable property in Maine on which they pay an annual tax.

Photo by Maine Forestry Dept.

## PERMANENT IMPROVEMENTS

We desire to enumerate here the different permanent improvements that were made during the past season; a more particular account of which can be found in the Chief Forest Fire Wardens' reports, published elsewhere.

### *Steel Towers.*

STATION	WATERSHED	HEIGHT IN FEET
Moxie Bald Mt.	Kennebec	12
Squaw Mt.	Kennebec	12

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Aziscoos Mt.	Androscoggin	24
Speckles Mt.	Androscoggin	36
*DeBoulie Mt.	St. John	12
No. 9 Mt.	St. John	36
Soubungo Mt.	Penobscot	12
Black Cat Mt.	Penobscot	48
Passadumkeag Mt.	Machias	36
Center Mt.	Penobscot	12

\*To be completed in 1920.

During the past season the department has built ten camps and about 150 miles of telephone line. Fifty-five telephone instruments were purchased and installed and six test sets were added to the service. During the winter of 1918-1919 a thirty-foot motor boat with a twenty-horsepower motor, the Catherine B., was built by E. M. White & Co., Oldtown, Maine, and placed on Chamberlain Lake. This large boat is of sufficient power to patrol the lake in all weather and adds greatly to the protection of this territory. The smaller boat used formerly on Chamberlain was placed on Eagle Lake. A boat house has been built on the shore of Chamberlain Lake near the Chamberlain Farm buildings. The main improvement made on the telephone lines the past season was the building of a twenty-five-mile line connecting the Chesuncook region with the Allagash region. This was built early in the spring and runs from Chesuncook to the Tramway Camps at head of Chamberlain Lake via Mud Pond. This was a very expensive piece of work, but it is the belief of this department that it is money well invested. If necessary, wardens can now be called from the lower Allagash region to help fight fire in the upper section of Chesuncook region. Another motor boat was purchased and put in Grand Lake. There was also purchased by this department early in the season 32 dozen shovels, 46 dozen pails, 26 dozen axes, 24 dozen mattocks and five canoes. Seven Ford cars were purchased and placed as follows: One in Machias watershed under the supervision of F. E. Patten, Cherryfield; two in St. John watershed under the supervision of C. L. Weeks and C. M. Austin, and three in the Penobscot Watershed under the supervision of D. H. Lambert, R. L. Brick and John E. Mitchell.

#### *Station Maps.*

The fourteen panoramic maps which were sketched last season have been completed and installed in the stations. Our Engineer has sketched maps for the following stations during the past

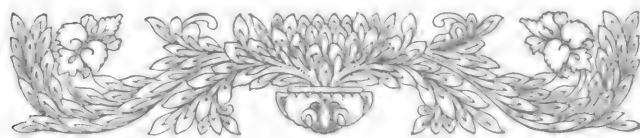


season: Back Cat Mountain, Squa Pan Mountain, Mitchell Mountain, Washington County Bald Mountain, Passadumkeag Mountain, Squaw Mountain, White Cap Mountain, Moxie Bald Mountain, Spencer Mountain, Soper Mountain, Allagash Mountain, Priestly Mountain, Soubungo Mountain, Center Mountain, Beetle Mountain, No. 9 Mountain, and Nulhedus Mountain. Early next spring out of the sixty-four lookout stations now in use in the Maine Forestry District fifty will be equipped with these maps. This leaves seven maps of these stations to be sketched; the other seven are only emergency stations. The tabulation on page four will show the amount of money expended for supplies and construction under the heading of construction work.



A YEAR'S SUPPLY OF STOVEWOOD ON HAND.

This logging concern believes it good business to have a supply of dry wood on hand and each winter cuts and hauls up next season's supply. The argument for this is that three cords of seasoned wood will do as much work as four of green. Also an ample supply of good wood on hand tends to add sunshine to the camp cook's disposition and makes him more devoted to his art.



FINANCIAL STATEMENT  
MAINE FORESTRY DISTRICT.

December 31, 1919.

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*Receipts*

Balance on hand January 1, 1919 .....	\$ 7,023.87
1919 Assessment .....	112,773.87
Interest on Deposits .....	119.96
Miscellaneous Income .....	3,374.57
	<hr/>
Total Receipts .....	\$123,292.27

*Expenditures*

Expense of fire protection during season of 1919	
(For detail see watershed expense) .....	121,158.58
	<hr/>
Balance December 31, 1919 .....	\$2,133.69

EXPENDITURES — MAINE FORESTRY DISTRICT

—1919—

	ST. JOHN	PENOBSCOT	KENNEBEC	ANDROSCOGGIN	MACHIAS	TOTAL
Chief Wardens	\$ 6,079.04	\$ 6,446.26	\$ 3,996.70	\$ 308.30	\$ 1,520.12	\$18,350.42
Deputy Wardens	719.47	677.85	108.43		163.05	1,668.80
Lockout Expense	8,266.05	13,403.42	7,856.34	4,805.97	3,331.87	37,663.65
Patrol Expense	11,134.10	6,283.22	605.42	1,958.58	946.92	20,928.24
Fire Expense	1,835.91	2,570.40	1,245.20	216.19	534.99	6,402.69
Tools and Supplies	6,153.61	7,850.30	4,569.21	1,599.51	2,782.41	22,955.04
Admin. Charges	950.20	969.91	953.43	942.00	953.48	4,769.02
Misc. Charges	904.28	1,129.02	1,444.68	744.41	823.76	5,046.15
TOTAL	\$36,042.66	\$39,330.38	\$20,779.41	\$10,574.96	\$11,056.60	\$117,784.01
		Refunds from various sources during the year .....				\$ 3,374.57
						\$121,158.58

Federal Expenditures

	ST. JOHN	PENOBSCOT	KENNEBEC	ANDROSCOGGIN	MACHIAS	TOTAL
	\$ 683.40	\$ 1,148.40	\$ 1,820.40	\$ 227.40	\$ 1,847.40	\$5,727.00

### Guardians of the Forests of Maine.

In the Spring of 1919 the Forestry Department instituted a new project; namely, the organization of the Guardians of the Forests of Maine. The first meeting was held at Augusta April 8th and 9th and attended by over forty chief forest fire-wardens and representatives of the timberland owners. The program of this meeting was as follows:

#### TUESDAY FORENOON

Commissioner and Deputy Commissioner met the Wardens at  
9:36 and 9:50 trains.

10:00 o'clock

Assignment of rooms at the Augusta House

10:30 o'clock

Meeting in Senate Chamber at State House

Calling of the roll

10:45 o'clock

Address of welcome by the Commissioner

11:15 o'clock

Question Box

12:00 Noon

Luncheon at the Augusta House

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#### TUESDAY AFTERNOON

2:00 o'clock

Address, Maine's Forests

HON. BLAINE S. VILES,  
*Former Forest Commissioner*

2:30 o'clock

First Aid Work

MAJOR BIAL F. BRADBURY

3:00 o'clock

Address on Fish and Game

COMMISSIONER WILLIS E. PARSONS

4:00 o'clock

Moving Pictures at Colonial Theatre

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#### TUESDAY EVENING

7:00 o'clock

Banquet at Augusta House

Music by Merrill's Orchestra

Address, "My trip across as Manager of the New England Sawmill Units"

E. C. HIRST,  
*State Forester of New Hampshire*

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WEDNESDAY FORENOON

7:30 o'clock

A Real Woods Breakfast, Augusta House

8:30 o'clock

The Commissioner and Deputy Commissioner, in the offices at the State House, conferred and advised with the Wardens in regard to the work for each Warden's own territory

11:00 o'clock

Meeting in the Senate Chamber for final talk and final adjournment

12:00 Noon

Farewell luncheon at Augusta House.



Logging in Little Wassataquoik Lake Region.

Photo by E. B. Draper.



## Reports From Chief Wardens.

Hosea B. Buck, Bangor, Chief Warden, Northwestern part of Aroostook County.

In patrolling this territory there were three active chief wardens, viz:—Grover C. Bradford, Ervin L. McKenney and Fred A. Lancaster.

By active, I mean these men were on the work continuously during the season and were held responsible for the efficiency of the patrol in the special territory which was assigned to each.



### ABANDONED FARM SCENES—1.

New England's abandoned farms are frequently "viewed with alarm" in the public prints; but in Maine they are serving as nurseries for young timber. Usually the fields are mowed and the hay gathered for a number of years after the farm is abandoned as a place of habitation. Sooner or later the fields also are abandoned and then the young seedling trees begin to grow. Some very creditable pulpwood operations are now being made on farm land that the older inhabitants can remember as mowing fields. Although lost to agriculture the abandoned farms will certainly help out the waning timber supply.

Photo by Maine Forestry Dept.

### ASSIGNMENT OF TERRITORY

Section 1, Grover C. Bradford, Chief Warden; Permanent address, St. Francis, Maine.

#### District No. 3

This section covers the watershed of the St. Francis River in Maine; the Little Black River in Maine; the Allagash River from

its mouth to Umsaskis Lake; and the St. John River from the mouth of the St. Francis River to the mouth of Big Black River.

Mr. Bradford lives at St. Francis, where he has switch connections with all the woods telephone lines and with the Fort Kent Telephone Co.'s lines and the New England lines. It is usually very easy to get into telephone connection with Mr. Bradford from our Bangor office; and through him Mr. Ervin L. McKenney, Chief Warden of the Upper St. John, can be reached, which makes it possible for me to keep in close touch with the greater part of this territory.



#### ABANDONED FARM SCENES—2.

Showing young spruce and fir seedlings growing in field abandoned six years.

Photo by Maine Forestry Dept.

Section 2, Ervin L. McKenney, Chief Warden; Permanent address, Sebago, Maine. Summer address, St. Pamphile, P. Q.

#### District No. 4

Mr. McKenney was located on Twp. No. 14 R. 16, close to the Canadian Boundary, and on the road leading from St. Pamphile, P. Q., to Seven Islands farm on the St. John River in Twp. No. 13 R. 15.

This section covers the Canadian Boundary adjoining townships Nos. 15 R. 15, 14 R. 16, 13 R. 16 and 12 R. 17; the Big Black River

watershed in Maine; and the St. John River from the mouth of Big Black River to the northwest branch of the St. John River. After several years' experience on the patrol we feel that there is but little fire danger on the St. John River in this section. During the summer season the water is usually at a low pitch, not easy to traverse with canoes. For this reason we have not during the past season maintained a patrol on the river. To off-set this favorable condition in this section, we have some 28 miles of the Canadian Boundary which is nearly always a source of danger. The Canadian farmers in clearing land often burn during a dry period



### ABANDONED FARM SCENES—3.

Young spruce, pine and fir in old field abandoned fourteen years.

Photo by Maine Forestry Dept.

and with a westerly or northwesterly wind, and our Maine forests are dangerously exposed. But it is only fair to state that during the past few years the Canadian Government, through its Forestry Department, has done much to reduce this fire danger.

Section 3, Fred A. Lancaster, Chief Warden; Permanent address, Old Town, Maine. Summer address, Chesuncook, Maine.

District No. 6

Mr. Lancaster was located at the Eagle Lake end of the "Tramway" connecting Eagle and Chamberlain Lakes.

This section covers the watershed of Eagle Lake; Chamberlain Lake; Telos Lake; Churchill Lake; and Allagash Lake and Stream.

Mr. Lancaster connects with Ralph L. Brick, Chief Warden, at Mud Pond and with John M. Mitchell, Chief Warden, at Telos Lake. As will be seen by reference to this territory, the patrol consists practically of lake work. On Chamberlain Lake a motor boat has been used during the past four summers.

During the winter of 1918-1919 a new motor boat, the Catherine B., was built by E. M. White & Co. at Old Town, upon order of your Department. It was put in operation on Chamberlain Lake



ABANDONED FARM SCENES—4.

Poplar trees growing in field abandoned eighteen years. There is a secondary growth under this poplar of young spruce and pine from two to four feet in height.

Photo by Maine Forestry Dept.

in the spring of 1919. It is a large boat and of sufficient power to patrol the lake in all weather and adds greatly to the protection of this territory. The smaller boat formerly on Chamberlain Lake has been placed on Eagle Lake. A boat house has been built on the shore of Chamberlain Lake, near Chamberlain farm buildings, in which the Catherine B. is properly housed for the winter. The smaller boat is stored in a building left by recent lumber operators on the shore of Eagle Lake.

### FIRE LOOKOUT STATIONS.

In this territory we have five lookout stations as follows:—

1. On Depot Mountain in Twp. No. 14 R. 16, Aroostook County.

This station is a 60 ft. steel tower built in 1914, replacing a platform station in a high spruce tree.

2. On Rocky Mountain in Twp. No. 18 R. 12, Aroostook County.

This station was originally built in 1907, at the expense of those owning land in that immediate vicinity. In 1917 a new log tower was built on another bluff of this mountain. From the two bluffs a view can be obtained in all directions.

3. On Soper Mountain in Twp. No. 8 R. 12, Piscataquis County.

This tower was originally built of logs in 1909. In 1916 it was re-built of logs.

4. On Priestly Mountain in Twp. No. 10 R. 13, Piscataquis County.

This is a log tower, built in 1910. This is the best log tower we have in this territory. It has a house on the top for the watchman.

It commands a good view of a large area in all directions.

5. On Allagash Mountain in Twp. No. 7 R. 14, Piscataquis County.

This is a log tower, built in 1916.

The log towers are in good usable condition. At best, the life of a log tower is limited to a few years. The location of the towers at Allagash Mountain, Soper Mountain and Priestly Mountain almost precludes the possibility of erecting steel towers. It appears to be a question of replacing with log towers as conditions demand.

The steel tower at Depot Mountain was re-painted in 1917 and is in good condition.

### CAMPS

There is a camp at each of the lookout stations, in which the watchman lives. The Department also owns camps built for the use of the patrolmen, located as follows:—

At the Castonguay settlement, so-called, on the St. John River, in Twp. No. 16 R. 12; at the mouth of Big Black River; on the westerly bank of the St. John River, in Twp. No. 15 R. 13; on the westerly bank of the St. John River, about one-half mile below Seven Islands Farm in Twp. No. 13 R. 15; near the Canadian Boundary, on the road leading from St. Pamphile, P. Q., to Seven Islands Farm, in Twp. No. 14 R. 16; at English Lake in Twp. No.



12 R. 17; on Round Pond, on the Allagash River in Twp. No. 13 R. 12; on Umsaskis Lake in Twp. No. 10 R. 13; and on St. Francis River in Twp. No. 20 R. 11 and 12.

Of these camps, those on Twps. 14 R. 16; 12 R. 17 and 10 R. 13 are fitted with the necessary equipment for permanent occupancy. The others are used but temporarily by the patrolmen. They are so located as to be convenient as temporary stopping places.

### TELEPHONE LINES.

The following telephone lines are owned by the Department.

St. Francis to head of Glazier Lake in Twp. No. 18 R. 10, a distance of 10 miles; Dickey, at mouth of Little Black River in Twp. No. 16 R. 11 to Rocky Mountain station in Twp. No. 18 R. 12, a distance of 15 miles. The Dickey line as above noted, follows the St. John River to the St. John Farm, so-called, in Twp. No. 14 R. 14, a distance of 30 miles.

From camp on Twp. No. 14, R. 16 to English Lake camp on Twp. No. 12 R. 17, following the Canadian Boundary a distance of 13 miles.

From camp on Twp. No. 14 R. 16 to Priestly Mountain on same township, a distance of 4 miles.

Other telephone lines on the Allagash and St. John Rivers, and lines connecting these rivers, are owned partly by the Department and partly by the various lumbering interests and the land owners. These lines have been built from time to time and have been used in common.

### FIRES

This territory has been practically free from forest fires the past season; only two small fires having gotten beyond the camp fire stage. While the patrolmen have extinguished many camp fires in their inception, no fires of any consequence have occurred.

I want to call attention to the extreme good will and hearty coöperation of the people who live near or within this vast territory, and of the lumbermen and the crews of men working in the forests.

To my mind, based upon personal observation and contact with these people, a very great part of our success in this fire prevention work should be accredited to these people. Without honest, hearty coöperation, our small force of patrolmen, for such a large area, would be dealing with a difficult proposition.

The telephone lines have been repaired during the season.

In general the lines have been in good working order. The wire and connections for a new telephone line connecting Priestly Mountain lookout station with Soper Mountain lookout station was shipped to Chamberlain Farm during the winter of 1918-1919. Owing to the scarcity of labor and extra cost of building, the work was put over to another year.

The new line from Chesuncook to the Tramway camps at head of Chamberlain Lake, via Mud Pond, built in spring of 1919, by Ralph L. Brick has given good service.



ABANDONED FARM SCENES—5.

Young timber growing in field abandoned twenty-six years.

Photo by Maine Forestry Dept.

On the whole, I think the telephone lines are giving a fair average service for woods lines. This service can be, and no doubt will be, greatly improved from year to year as the Chief Wardens and patrolmen come to appreciate the great importance of the telephone.

James M. Pierce, Houlton, Chief Warden, E Plantation, Hammond Plantation, C. & D. R. 2, Aroostook County.

District No. 7

On my return from Augusta, I set out to apply to our system the things that I had learned at the meeting about telephones. We

lowered about three miles of line, began using sleeves at splices and tried several new methods of fastening insulators.

The main improvement in the district this year was the erection of a thirty-six foot steel tower, on the north peak of Number Nine Mountain. This tower adds very much to the usefulness of our lookout. The patrolmen and watchmen cleaned up the trails around the lookout in better shape than I have ever succeeded in having them. We had good connections with the Maine Last Block Company's camp on Twp. 8 R. 3, where the Company kept a watchman nearly all summer. I had my man do quite a lot of work on



ABANDONED FARM SCENES—6.

In the background is merchantable pine growth in old field abandoned fifty-two years.

Photo by Maine Forestry Dept.

this line, as we might need it very much some time, and it connected on to our wire about half way out.

For next year I would like very much to see a better camp built for the watchman, as the present one is 9 by 12, with a three-and-one-half-foot wall, and has a roof of cedar splits covered with roofing paper. This is too small, as the patrolman makes this his headquarters.

S. C. Cummings, Haynesville, Chief Warden, Southern part of Aroostook.

District No. 8

I herewith submit my report as one of the Chief Wardens of Aroostook County for the year 1919 in my district, which is the southern part of Aroostook County.

The season commenced quite dry, and later it changed to be very wet; I only had two small fires of any consequence. These were in May on Two, Range Three and in August on Two, Range Two at Wytopitlock Lake, and were extinguished quickly and at a small expense.

In regard to patrolling and patrolmen, I would suggest having more lookout stations and less patrolmen, although of course there should be a certain amount of patrolling done. I would say, if it is proper, it is necessary to have some patrolmen, especially around the pulp operations and on the by-paths and highways where the men are travelling to and from the camps.

I think we have in this State at the present time one of the best fire systems in New England, and as the years go by, this system becomes more efficient and the Chief Wardens and deputy wardens are onto their job, and more especially in regard to posting the fire notices. That is one of the best things in the fire service today. The travelling public begins to see that the forest fire commission of this State is organized to protect the forest and in protecting the forests we protect the resources of the State and every person in the State.

In regard to the lookout stations, I have one in my district, completed this season, 1919, and the observation from the lookout covers a very large territory; its location is on Mitchell Mountain in the town of Haynesville, Aroostook County, Maine.

Claude M. Austin, Stockholm, Chief Warden, Northeastern part of Aroostook, District No. 1.

I would recommend that a small camp be built at the Long Lake Thorofare on Township 17, Range 4, for a patrolman's camp and also that a telephone line be built to it, as there is no telephone there that can be used in an emergency. We have three old telephone boxes that are 2500 Ohms and would like to replace them with new 1600 Ohm boxes and would like to put in a line of poles in the town of Winterville where it connects with the Aroostook Telephone Co. line, as it is not a very good place there, and it would pay to do it. Will need a new ignition system for the motor boat.

as it has not been satisfactory running on batteries, as the batteries have been of poor quality and have given a lot of trouble. The car will not need any expensive repairs made on it, but should have a storage battery to be used for lighting and ignition.

I have built a camp 16x20 on Township 16, Range 4, on Madawaska Lake for a patrolman's camp and have partly equipped it, and it has been a great improvement over a tent, as the place can now be locked up. Have changed the switch from the Yerxa camp to the tower, where the lookout watchman has it in his own hands about the line being split, and it has been a success in every way, as the watchman has had a clear line at all times. It also cut the line so that the load was taken off the Aroostook Telephone Company's line, and in wet weather this has helped a lot. While the change in the switch brought a complaint from one of the sporting camp owners I cannot see where it has not been a great improvement and should have been done before. Have started to change the line from Stockholm to Guerette and put it along the road. Have made a good start on it and it will be a big improvement when it is done, as it will take it out of the woods, so there will be a lot of time saved in locating trouble with the line.

Charles L. Weeks, Chief Warden, Aroostook and Big Machias Rivers, District No. 6.

I herewith submit my report as Chief Forest Fire Warden of District No. 6, St. John waters, for the fire season of 1919. The first work of the season was hanging telephone wire from Round Mountain to McKeen Crossing on the Machias River, a distance of four miles, thus saving patrolling and repairing sixteen miles of wire to the same point as has been done in the past. The result has been most satisfactory as the telephone service has been excellent all through the season. We also hung three and one-half miles of telephone line from Round Mountain lookout to the American Realty Company road where we connected with their line, thus giving the Watchman at Round Mountain direct communication with all the Realty Company's camps from Ashland to the Allagash. We hung four and one-quarter miles telephone line from Sterling Ridge in Masardis to the foot of Squapan Lake to patrolman's camp. On the Munsungan line we took down and cut out all bad connections and soldered all the connections from Oxbow Flat to Norway Bluff lookout. All that the telephone lines needed





ABANDONED FARM SCENES—7.

Showing a young spruce, bearing seed cones, growing in field abandoned nine years.

Photo by Maine Forestry Dept.

to Squapan Mountain lookout were a few minor repairs. The telephone service all through my territory has been excellent; could not have been better, all the season.

We have made several new trails and have put all old trails in good condition. In my territory this season we have had ten fires on which we have had crews of men. The land and timber damage has been comparatively small, owing to the prompt work of the watchmen in reporting fires, and the quick response of the deputy forest fire wardens and patrolmen when notified of the fires.

Right here I wish to thank all for their efficient work during the season. I wish to thank especially Mr. A. H. Rhineland, Superintendent of the American Realty Co., for the assistance he rendered us in furnishing outfit for crew of men to fight the fire which occurred at McKean's Crossing on July 4th. Also I wish to thank Mr. Harry E. Hasey for the kindly assistance rendered in bringing more men and provisions when needed, to help in getting this same

fire under control. I wish to speak personally of motor boat patrolman Robert J. Walsh, who not only performed his duties faithfully and well, but played the part of a life saver in rescuing two people from drowning in the waters of Squapan Lake. The same watchman served this season who served in 1918.

The principal cause of fires in this section has been the carelessness of local fishermen in leaving lunch and camp fires unextinguished; but two fires at least were caused by carelessness in the use of smoking

material. The two fires occurred in the pulp woods. Three of the reported fires were set by lightning.

I would recommend that a lookout station be established on the south point of Chandler Mountains on Township 10, Range 7, as Middle Brook Mountains and Chandler Mountains obstruct a good deal of the view from Norway Bluff lookout, while the Aroostook Mountains and Chandler Mountains obstruct a good deal of the



ABANDONED FARM SCENES—8.

White birch, spruce and poplar in field abandoned twenty-two years. Photo by Maine Forestry Dept.

view from Round Mountain lookout. Each of these lookouts is about twelve miles from Chandler Mountain. A lookout on Chandler Mountain would be about twenty-five miles from Squapan lookout.

It seems to me this is too large a territory to depend on three lookout stations to cover. It surely is in hot, smoky weather. I would recommend that a telephone line be hung from Norway Bluff telephone line to Chandler Mountain and from Chandler Mountain to Machias telephone line at the forks of the Machias, thus giving Norway Bluff lookout direct communication with Ashland central and Chief Warden. A lookout station if established at Chandler Mountain will need a 48-foot steel tower, three telephones and material for constructing fourteen miles of telephone line. If this lookout is not established I would recommend that a telephone line be hung from Norway Bluff lookout direct to Round Mountain lookout. In some way Norway Bluff lookout should be connected with Ashland central. This would take two telephones and material for about fourteen miles of telephone line.

Another important recommendation I would make is that a camping outfit be furnished the Chief Warden, to consist of tents, blankets, dishes and cooking utensils for about thirty men, also two good cross-cut saws; I now know what it is like to try to borrow or hire an outfit with which to get into the woods to fight fire.

In conclusion let me thank you for the consideration and help in my work that your department has shown me.

D. H. Lambert, Old Town, Chief Warden, Seboomook Territory,  
District No. 1.

The first part of the past season was the driest we have had for several years, but, notwithstanding, we had only one fire and this did but very little damage. The past season I have done no new work, but have had sixty-one miles of telephone to keep in repair. I would recommend that a new steel tower, sixty feet high, be put on the west peak of Green Mountain, as this peak covers more territory and is only about two miles from the new Dole Brook road.

A. H. Chase, Milo, Chief Warden, Seboeis and Schoodic Lake territory, District No. 2.

We started April 28th to go over our telephone lines, and put them in fine condition. It took some time as we had some 150



### MOUNTAIN SLOPES DENUDED BY FIRE.

Showing slides and erosion after forest cover is burned off. Thus forest fires change tree covered slopes to barren ridges of rock—waste land on which reforestation is almost impossible. Scene from Attean Pond, Somerset County, Maine.

Photo by Maine Forestry Dept.



### SLIDE ON BURNED OVER MOUNTAIN.

Showing a serious erosion of soil taking place after vegetation is killed by fire. Scene on Wood Pond, Maine.

Photo by Maine Forestry Dept.



ONE HORSE YARDING ROAD.

Where one horse only is used in yarding timber the saving of small growth and undersized trees is very apparent. Only a narrow path shows where the logs have been hauled to the yard and there is but slight disturbance of the unmerchantable stuff, which is thus left to grow and mature.

Photo by Maine Forestry Dept.

miles to look over and had them O. K. by the time the watchmen went on. With the exception of a few times, we have had good service. The watchmen and linemen have all been trusty and faithful. My territory (until last year) was covered by two Chief Wardens and it keeps one busy. We had some difficulty to locate trouble with the line and I got Mr. E. L. Chase of Brownville to trace the line with his test set and found it at Arbo's. For this service he charged nothing. The lightning had burned out some insulated wire and the lineman could not find it without an instrument. We have had very few fires; one at

Long Pond on 7 R. 9 was put out at a small expense. Had one on White Brook, which was put out by the river drivers. I would recommend that while the Howland Pulp & Paper Co. are driving out of White Brook into the main river a patrol be put on to look



after the fires that might start. There was one started this season and had quite a headway, but with the amount of pails stored there and a large crew of drivers it was soon extinguished. But it is a fire trap along this stream as there is a lot of slash and it should be looked after carefully. I have been over the district and took account of the tools. I found some in the boxes and some scattered around. I collected all I could find and locked them up. I do not think we have lost many this season. I have taken in the large hanging

signs and stored them for the winter. I took up the telephone line from Logan Brook around the West Branch Ponds to L. P. Chadwick's, a distance of about five and one-half miles, and cut a new trail from the tower on Whitecap to the main line on East Branch Pleasant River, a distance of about four and one-quarter miles. Used the wire and splits that we took up; had to sack the wire from three to seven miles. Got a fine trail, and it does away with switching at Chadwick's and is a direct line to Arbo's, North Brownville, and gives excellent service. Have cut



TWO HORSE YARDING ROAD.

Compared with the one horse road this is a regular highway from eight to twelve feet wide. Where timber stands thick and there is considerable swamping to be done a large part of the territory actually yarded over is entirely laid waste.

Photo by Maine Forestry Dept.



bushes on trails and around cabin, also cleared away 25 feet around foot of tower. The inspector this year recommended a steel tower for this mountain, a 27-foot tower, and I agree with him, as the old one is a wooden structure and is in poor condition and only 12 feet high. The watchman on this mountain needs a new camp. The present one is old and rotten and not fit to live in. I would recommend that some changes be made on the gauntlet line to make it shorter, as the line now goes to the different old lumber camps of Mr. Pride's, and would be less distance to patrol. With the consent of the Forest Commissioner I have purchased a camp at a reasonable cost to be used by the lineman, and there should be some repairs on the camp at the gauntlet to make it comfortable. This line is some 32 miles long from Arbo's to top of mountain and there is no stopping place along the line; only some old lumber camps broken in and fallen down.

**Mattamiscontis Line:** The distance from the tower to Seboois Plantation on the Canadian Pacific Railway is about seven miles and until this year we have had no line to this settlement. I got permission from Mr. V. R. Nason to connect onto his line near his lumber camps. We cut a trail two miles and strung new wire, so we get good service from tower to the settlement. I also had Mr. Nason appointed deputy warden. We have also cut bushes on the trails and around the tower and camp, painted the house on the tower and have on hand paint to paint tower next spring. It was painted two coats last season.

**Ragged Mountain Line:** This line is in good repair but could be improved by putting in some new wire in places and taking out some of the old where it has been repaired with short pieces. We have cut the bushes (or Mr. Monroe did) around tower and trail. Painted the tower house and steel tower and put on shutters for winter.

**Boarstone Mountain:** We started in to clear up around the camp, where the lumber was cut to build the camp, and got it well along when called off. The tower has shutters on and everything is O. K. for winter.

I think all the towers and camps are left all right and am in hopes will find them the same in the spring. The watchmen on the different towers cut the bushes around towers and trails.

Thomas Griffin, Millinocket, Chief Warden, Lower Lakes, West Branch of the Penobscot River, District No. 3.

I wish to submit my report for District No. 3 for the season of 1919. In the early spring we repaired all telephone lines so that they were ready when the fire season opened. We built a 48-foot steel tower on Black Cat Mountain, 1 Range 9. This tower was fitted with table, map, glass alidade; and two telephones—one connecting with the Great Northern Paper Company line, central at warden's home at Millinocket; the other connecting onto Charles Daisey's line reaching the sporting camp section to the west branch. We used about one and one-quarter miles of wire here. We built a watchman's camp, put telephone in this; camp 14x20, sawed lumber. This camp was furnished with everything to make a man comfortable. We fitted up an old camp on the East Branch, 2 Range 7, for patrolman and furnished it with dishes, stove and such things as are necessary for one man. Installed a telephone here and ran one-half mile of wire to connect with the East Branch driving line; this line runs into Mr. Robbins' house at Grindstone and New England line to Millinocket. Built sleeping room onto camp at Double-top Mountain.

I would advise that the lookout at Mount Katahdin be discontinued indefinitely; and also Jo Mary until such times as the department sees fit to put a steel tower on it. I think this country is well covered now. Would recommend a tower for either Whetstone or Hunt Mountain on the East Branch to cover a place up the Branch that we cannot cover now; should we get this tower we have wire enough at Grindstone and I think telephones enough to equip this outfit. Would change telephone line now running from Millinocket to Norcross, then to Ragged Mountain, to run on New England telephone poles from Millinocket to Norcross, cutting out about nine miles of line and possibly cutting out a central at Norcross. A car could be used in this district now to good advantage. We could cover Indian 3, A, R. 7; 1, R. 7; 1, R. 8; 1, R. 9. There is only one train a day each way that will stop at Grindstone, and this causes a lot of waste time.

John B. Mitchell, Patten, Chief Warden for Upper East Branch Waters of the Penobscot River, District No. 4.

I have the honor to submit to you the following report of the forestry section of Penobscot and Piscataquis Counties for the year 1919. There have been only four fires of any consequence in my territory this season.



A FAVORITE LANDING SPOT.

To this landing came spruce sawlogs, spruce pulp, white birch logs and other hardwoods.

Photo by Maine Forestry Dept.

On May 14th I was notified of a fire at McCarty, on the northeast quarter of 5, Range 10. This fire burned over approximately ten or eleven acres. It did no material damage. The fire was caused by the carelessness of a cookee who built a fire under a hollow birch tree to boil luncheon for the drivers of the Lincoln Pulpwood Co. The fire smoldered away for two weeks and then the tree fell, at once setting fire to the dry forest. The Lincoln Pulpwood Co. rushed their employees to the fire and had it all out by the 18th. On July

1st I was notified of a fire at McCarty Camps on the northeast quarter of 5, Range 10, burning about one acre. It did no damage to the forest but burned a few cords of pulpwood. The fire was caused by a careless cookee not extinguishing his lunch fire. On August 13th the lookout man at Horse Mountain notified me of a fire at Hay Lake, on the northeast quarter of 6, Range 8. This fire was started by blueberry pickers not putting out their

fires, as near as I can find out. It burned over an area of 15 or 16 acres of old burn, doing no damage to the green growth. It was exceedingly dry at this time of season, but we fought it by trench and water. It was all out by the 19th and a big rain followed.

On Sept. 22nd I was notified of a fire at Arbo Dam in the Lincoln Pulpwood Company works on the southeast quarter of 5, Range 10. The Lincoln Pulpwood Co. again rushed all the

men from their camps to this fire. It was out by night. I went there at once and found that this fire was in old cuttings and did no damage to the woods, but burned a little pulp. The cause of this fire is unknown.

On January the 30th I went to Island Falls and bought a gasoline motor boat for the Forestry Department and hauled it to Grand Lake Sebois. This boat has a six-horsepower Grey engine; I have found this boat a great help, as Grand Lake Sebois is six miles long and we had nothing but an eighteen-foot canoe to use for fire purposes. On February the eighteenth I began to build boxes to store fire-fighting apparatus in for use in their several places. I built five good pine boxes 8 feet long by 2 feet 6 inches wide by 2 feet 8 inches high. I painted them red and put them in the following places: One at McCarty Camp at 5, Range 11; one at



CUT-OVER LAND.

Young spruce left after diameter limit cutting. Some loss from windthrow is apparent.

Photo by Maine Forestry Dept.

Millimegassett at 7, Range 8; one at Grand Lake Sebois at 8, Range 7; two at my home—one for tools and one for tents and spreads.

On March 25th started with crew and provisions to build a line from Millimegassett to Munsungan for the Forestry Department, a distance of 6 miles, to hook on the forestry line in Mr. Weeks' territory by the way of Norway Bluff, Oxbow and Masardis.

On April 22nd started soldering and re-hanging the Millimegassett line to Sebois Bridge. This line was badly broken down by



The Lookout Watchman's Home Camp on Moxie Bald Mountain.

Photo by J. H. Gordon.

the heavy sleet storms and the trees having been blown across it in the winter. We re-hung the Hay and Lane Brook line to cabin, on 7, Range 6. We put up the line to Horse Mountain. We hooked the Beetle Mountain line at Webster Brook and hung it up as far as Eagle Lake line, then the lookout man and patrolman at Beetle Mountain hung up the old line as far as the wagon road that goes in to upper Moose Pond, and pulled out the old Beetle Mountain line and put it on the new wagon road, which was cut last year, and out to the Eagle Lake road, shortening this line two and one-half or three miles.

An alidade and range finder was installed at Horse Mountain and another at Chase Mountain and we have found them a great help in locating fires. It is a far better method than the old one. On May 25th we started up to build the Center Mountain lookout.



This had been hauled up to the foot of the mountain the year before on a hand sled. The steel house and cement was hauled up to the top of the mountain by the Lincoln Pulpwood Company's team and men, and the Forestry Department paid for the same. Owing to the mountain being so steep, it was a hard job to get it up to the top. By June 15th we had the tower up, the telephone installed and everything in running order. A cabin was built last year. We put in a call bell on the Sourdnahunk line to connect with Mr. Griffin's territory. A switch was installed so we had connection through to Patten or Millinocket.



INTERIOR OF WATCHMAN'S CAMP.

It is the policy of the Maine Forestry Department to give the mountain lookout watchman just as comfortable quarters as possible, so that the job will attract and hold the better class of men.

Photo by J. H. Gordon.

The patrol and lookout on Center Mountain built a bedroom, 8 feet x 14 feet, on the cabin. They painted the tower and house, and did a lot of clearing up around the lookout, and there needs to be some more done in the spring. The cabin at Beetle Mountain, which was used for the lookout and patrol, had two more logs put under it and moved back to be used for horses when hauling supplies or in case of fire. We also built a cellar in the side of the mountain, 6x6, and covered it with dirt. Then cut a trail from cabin to Lower Moose Pond, a distance of four and one-half miles. It was cut four feet wide, with logs and brush all removed. Another one was cut from this trail to the east side of the mountain, a distance of one-half mile. On this trail we strung the wire that goes from Beetle Mountain to Sebois Farm. A line of spots were made from Beetle Mountain cabin to the Eagle Lake tote road and





Sluice at Indian Pond Dam.

Photo by Maine Forestry Dept.

painted red, also spotted from cabin to Lower Moose Pond, and painted on trails previously cut to show that the Forestry Department cut these roads and trails. They pulled out some of the wire at Caribou Pond and strung it on this trail but did not have time to pull it all out this year. This work was all done by the patrolmen and lookout men in spare time.

On May 27th I spotted the Mount Chase trail and painted it. Then I spotted and painted the new road, cut last year, from

Scragley Lake to Millimegasset Lake and from there to the cabin on Spoon Mountain under the telephone line.

June 18th the lookout and patrolmen built on a bedroom on the Horse Mountain cabin, 9x12 feet, which was very much needed. The watchman gave the tower house two coats of paint inside and out.

Oct. 7th I went in to take up the Eagle Lake telephone line that we bought from the Lincoln Pulpwood Co. and I found that Mr. Murphy, the walking boss for the Barker Lumber Company, had his camps hooked onto this line. He said if we would leave the line until spring for his use he would take it down in the spring and hang it to Millimegasset for us.

I would like to suggest that the old fields and meadows on Sebois River be burned over every spring on account of the grass and weeds growing up in the summer. This has been a bad fire trap for the drivers as soon as the snow is off and for the fishermen later in the season. Also that the Webster Lake patrolman's cabin be covered with roofing this year. That a lookout be put on Lunkasoos or Pogey Mountain to take care of the Wissattaquoik country and the table lands on Mount Katahdin. That

a wagon road be cut from Eagle Lake wagon road to Millinocket Lake for fire purposes. I would suggest that spruce be peeled for a scow in case of fire, and a batteau with paddles and oars be furnished for this lake and a boathouse be built here big enough to house a batteau and a canoe. That a patrol camp be built on Millinocket Lake this coming season, as lumbering will begin in this section very soon and that will necessitate a gasoline boat or batteau in this lake, also a boathouse will have to be built and fire fighting equipment supplied.



Pulp Wood Sluice on the Side of Pogey Mountain.

Photo by E. B. Draper.

I would suggest that a box of fire-fighting equipment be placed at Beetle Mountain this coming season in case of an emergency. Also that a trail be cut from Beetle Mountain to Spring Pond, four feet wide, and painted as other trails are done. I would suggest that a new cabin be built at Mount Chase this coming season. This cabin was built in the spring of 1909. It is 12 feet on the outside and is too small and poorly located. I suggest that a trail be cut from Millimegassett cabin to the mouth of Munsungan River, a distance of five miles, under the forestry line. This trail should be cut four feet wide and painted red. I would suggest that the Forestry Department buy the Eagle Lake line, take it down as far as Scragley Lake and string it to Millimegassett Lake and around McDonald Cove and hook on to the Millimegassett line at the end of the cove; and that a new line be built around the north side of the lake along the south side of Big Millinocket, also along the south side of Little Millinocket, the south and west side of Lower Moose Pond, connecting up with the trail cut from Beetle Mountain this year. That the Hay and Lane Brook line be built from 7 range 6 patrol camp up to the Old Cut Lake road to Bryson's mill at head of dead water on Hay Brook; thence across to Snowshoe Lake on the Millimegassett line. Then Beetle and Spoon Mountain lookouts and Millimegassett and Grand Lake and Hay and Lane Brooks patrol will all be on this line going on to the main line at Sebois Farm with a switch. Also it would be well to see what trade can be made with the Nevers Brothers to tend this switch. I suggest that some trade be made with Luther Hall, the manager and one of the owners of the Bangor Lumber Co., about swapping Hay and Lane Brook line for new wire. I would suggest that the Forestry Department have some plans for the building of camps, for the use of the Chief Wardens in building cabins for the lookout and patrolmen.

I would suggest that the wire and splits for the new line to Millimegassett Lake be put in this fall, when the boat is put in, on the first snow. It would cost a lot more to haul it in the spring on the crust with a hand sled.

On May 20th I started all my lookout men and some of my patrols. This was very early, but owing to the season being so dry I found it advisable to do so. On July 30th the State Forestry Inspector of Lookouts came into my territory and we visited all the stations in my district.

I have found in my experience in this business, that occasionally there will be a fire started away from all roads and trails by

lightning or some unknown cause. It has occurred to me that it would be well if roads or trails are cut to these remote places and painted red, so that they could be followed by people travelling in the woods, and so we could get men and provisions to these places in case of fire. We would be able to get to them much more quickly. If these roads and trails were spotted and painted red the people travelling in the woods would naturally keep to these; or if a man was lost he would follow these trails one way or the other and not be going all over and setting fires where we could not get to them. In that way anyone coming on these trails and lines painted red would at once know that these belong to the Forestry Department. I believe that the future of the Maine forests depends largely upon the system of our forest fire protection. It is far more important to the State than to the individual that the second growth be safeguarded. For the good of the State the private land owners must be encouraged toward producing and protecting the second growth. The public opinion throughout the United States has moved steadily towards a just appreciation of the value of the forests, whether of planted or natural growth. In what way can we keep the appreciation of the people other than through a thorough system of fire protection for our forests. One important part of the protective system is the lookout station.

Of the enemies of our forests the greatest and certainly the most to be dreaded is fire, whose source may be the smallest match carelessly thrown away before extinguishing. Although in my experience in the five years that I have been Chief Warden I know that more small fires have been started in my territory by smoking cigarettes in the woods than in any other way. I have often wished that a law might be passed that would prohibit the smoking of cigarettes in the woods in the summer season. Such damage depends largely upon the condition of the forest and the available aid for fighting a fire. After a fire once gets well under headway in our forests, with high winds it would seem almost impossible to extinguish it without the help of a big rain.

Fred S. Bunker, Franklin, Chief Warden, Southern part of Hancock County, District No. 2.

We got through the season this year with very few fires and none that did any damage. I have all of the telephone line fixed up in very good shape. Had to have a good many cut-ins put in last spring as it was very noisy at times. I have built over the line

from the lookout to the Bowen Camps, a distance of one mile. It is now in fine condition. Mr. Bowen built this line a few years ago. He has not been at his camp for two years but he is willing for the State to use his line if it will keep it up. Mr. Small recommended last spring that I should do this. Mr. Bowen wishes me to use his camps in case of fires or in any way to help out the good cause. I would recommend that the State extend its telephone line from the station to the central office, so that we may have a clear line at all times, as at present there are fourteen parties on the



On the Landing.

Photo by J. F. Philippi.

line and at times it is bothersome. I would suggest that our fire camp be enlarged. It is only ten by twelve feet, and with the bed, sink, stove, etc., it is too crowded and also in summer very hot. An addition of about eight by ten would make it very comfortable.

I think it would be of great advantage to have a thirty-foot steel tower at this station; this would allow us to cover a much greater area. The slash in my section is well cleaned up. I have cleaned up the brush around the camps and the trails are also bushed out. I have been around and collected all my large signs.

In visiting the camp and lookout recently I found that some of the roofing at both places needs to be renailed and also repainted. I shall see to it at once.



J. J. Kneeland, Topsfield, Chief Warden, Northern part of Washington County, District No. 3.

In regard to painting the lookout—after the paint came there was no time that the weather would permit to paint the tower while W. A. Bailey was there, so I had Mr. Noble go and help me paint it at a suitable time. Will say in regard to improvements; tower well painted, new camp at foot of mountain, 16x16, built of peeled spruce and roof shingled; gable ends shingled and double floor laid; well cleared away around camp. In looking the tower over I find that it will need something done another season to save



On the Stream Drive—10 O'clock Luncheon.

Photo by J. F. Philippi.

the building, as the timbers are checking so as to let the water in; it will have to be all inclosed in order to keep it in good shape.

A. P. Belmore, Princeton, Chief Warden, Upper Washington County, District No. 4.

We have done all that was recommended by Mr. Small last spring. Merle E. Hoar, the watchman, has done a lot of work. In dull weather he cleared out the trail to the lookout and painted the spots red. He has cleared out the old road to the lookout and a trail to Pocomoonshine Lake and has cleared away the under brush and windfalls around the station. I should think he has about two acres cleared. I have taken down all the road signs and



have everything picked up and stored for the winter. I would recommend painting the tower and house in the spring.

George E. Hathaway, Jacksonville, Chief Warden, East Machias Waters, District No. 5.

For improvements we have completed a new telephone line connecting Cooper and Wesley watch towers, running through a good piece of forest land and in communication with lumber camps where help can be quickly found in a dry time; length of new line about three miles. I would recommend painting the watch tower, which is of wood.



Steam Log Hauler.

Photo by J. H. Gordon.

George G. Nichols, Jackman, Chief Warden, Kennebec Watershed, District No. 5.

A metallic telephone circuit has been constructed from my office in Jackman to Skinner, a distance of 23 miles; also from Attean Mountain to the main line, one and one-half miles, which has proven to be a great improvement over the grounded line. A new box has been installed at Kibbie Mountain and also one at Attean Mountain. I have caused a new camp to be built at Williams Mountain and a new telephone was placed in the tower. All trails have been put into first-class shape.

I would suggest that a new telephone line, a distance of four miles, be constructed from Williams Mountain to Cold Stream Pond

where it would connect with the H. P. McKenney line there and give a main line connection on the county road. I am of the opinion that the Hollingsworth & Whitney Co. would bear one-half of the expense. The telephone service in that vicinity has been very poor during the season just passed and the foregoing change would justify the expense in the improved service.

S. F. Peaslee, Upton, Chief Warden, Androscoggin Watershed, District No. 1.

This season a telephone line has been put up from Thurston's Camp, so called, on Twp. No. 4, Range 2, W. B. K. P., connecting



Gasoline Log Hauler with a Good String Behind It.

Photo by C. W. Grover.

with the telephone line running from Aziscoos Dam to Upper Dam, which was a needed improvement.

On the Androscoggin watershed the Maine Forestry District has erected a steel tower about twenty-seven feet high at Lookout Station No. 21 on Aziscoos Mountain in Lincoln Plantation. The telephone line to this tower is owned by the Maine Forestry District which connects with the Brown Company's telephone line near the Horace Bennett buildings in Lincoln Plantation, Oxford County, Maine, a distance of two miles or a little less.

The Maine Forestry District this season has also erected a steel tower about thirty-six feet high at Lookout Station No. 49 on Speckle Mountain in Grafton, Oxford County, Maine, the telephone

line to which is owned by the Maine Forestry District and connects with the Grafton and Upton telephone line in Grafton Notch, a distance of about two miles.

I would suggest that it may be well to investigate and ascertain whether it would be advisable to erect a lookout station on Rump Mountain in the west part of Twp. 5, Range 5, W. B. K. P., which is near the New Hampshire line; and if it appears advisable to erect a station there, to ascertain if the New Hampshire forestry interests will join in the expense.

Ezra N. Williams, Great Pond, Chief Warden, Northern part of Hancock County.

We have had only one fire of any importance this season. The tools are all properly cared for. The large signs are stored with other State property in my possession. For improvements we have a new steel tower, 39 feet high, erected on Passadumkeag Mountain on Grand Falls Plantation with new cabin three-quarters of a mile from tower, furnished with spring bed and mattress and everything necessary for the comfort and convenience of the watchman. Two new telephones and two and three-quarters miles of telephone line to Lincoln Pulpwood Co. camps. Have three dozen new tools. In preparing for next season I would recommend we have a line tester and canoe, also have all telephone lines and trails cleared of brush.

Ralph Wing, Flagstaff, Chief Warden, Kennebec Watershed, District No. 2.

There has been a new telephone line strung on Mt. Bigelow with insulated wire from the station down to the timber line. This has given great satisfaction. Also a telephone line from Stratton to Eustis and Chain of Lake Streams, about eight miles. The four stations in this district have been equipped with new alidades and glass-top tables and new maps. Towers and camps have been painted this season. I think this section is very well equipped for the fire service for the coming year.

C. C. Murphy, Rangeley, Chief Warden, Androscoggin Waters, District No. 2.

There were a number of fires started this past season in my territory, but prompt work soon controlled them. The watchman's camp at West Kennebago Mountain was repaired and put in first-class condition and new equipment was purchased for same. The



STREAM DRIVE—Working out a Side Jam.

Photo by E. B. Draper

steel tower and house on Saddleback Mountain were painted and the trails of the above two stations were bushed out and also put in first-class order. The District employed during the dry months of the season one expert telephone man, whose job was to put the telephone line in first-class order. For that reason the telephone service has been exceptionally good the past season.

R. L. Brick, Lily Bay, Chief Warden, Chesuncook Region, District No. 5.

The season of 1919 has been very favorable in Section 5 of the Maine Forestry District, Penobscot Waters. Only one fire occurred, and that was taken care of without any damage and at very small expense.

For improvements, there has been a new telephone line, twenty-four and one-quarter miles long, built from Chesuncook to Eagle Lake (Allagash) via Mud Pond and Chamberlain Lake, of No. 10 wire, and this line has been of great importance to the Forestry District. Also a branch line of two and one-half miles from Pine Stream to Chesuncook House (A. B. Smith's). The line from Chesuncook to the Grant Farm, owned by the Great Northern Paper Company, but used by the Maine Forestry District during the fire season, was built over and put in good condition.

The line from Grant Farm to Spencer Mountain Lookout, nine miles, was rebuilt and bushed out, making a first-class line of fifty-six and one-half miles from Spencer Mountain to Eagle Lake (Allagash). The tower on Spencer Mountain has been painted inside and out; also wooden shutters placed on same.

There has been a steel tower built on Saubunge Mountain, which is of great importance to Section 5. Also two and one-half miles of telephone line built from Soubungo, connecting the tower with the Cuxabexis line at Camp 3, Ripogenus Stream. This lookout has been furnished with full camp outfit, including fire tools, etc.; also one coat of paint on tower.

The telephone system, with the assistance of the Great Northern Paper Company clerks, has been one of the best. Also all other assistance has been rendered by the Company, and as one of the Chief Wardens of the Maine Forestry District I take this opportunity to thank them for their prompt and courteous assistance rendered at all times.

There has been a cabin built at Chesuncook Dam for your Warden's headquarters, also store room and out-buildings. This

is a large, roomy camp, built of shaved spruce logs, with full-size doors and windows and will stand inspection by any State official.

The automobile furnished by the Department was of great assistance and is in first-class condition. It is stored at the home of your Chief Warden in Levant, Maine.

#### SUGGESTIONS FOR 1920.

The trail from Grant Farm to Spencer Mountain should be cut out and fixed suitable for a team. Also a camp should be built at the spring at the foot of the Mountain. There should be a watchman's camp built at Soubungo Mountain out of sawed lumber. The material should be placed there on snow this winter.

Lumber or some other suitable material should be furnished to build a garage at Chesuncook Dam; also covering for a wood shed.

There are several small improvements that your Chief Warden will take up later for your consideration.

John M. Brown, Eagle Lake, Chief Warden Fish River Territory.  
District No. 2.

We have had a very favorable summer in my section, frequent light showers preventing the fires from getting started, although the ground remained very dry most of the time. There were no heavy rains to wet down any depth. I have no recollection of ever seeing the waters so low in streams of all kinds as they were at the close of the season.

Only three small fires were reported from the lookout stations, and they were put out with very slight damages being done.

I built a telephone line from Birch River Dam patrol camp to DeBoulie Mountain, eight miles, and connected this line direct into the Eagle Lake central office, a distance of one and one-half miles, on the telephone company's poles; also built a line one and a half miles to connect the Whitman Camps on to this line and installed a telephone in the camps which are situated at Island Pond 15 Range 9, making this line total length about 21 miles.

Repaired and put in good condition all the fire lines in my territory, and they were in good condition all summer until the big wind storm, which demoralized all lines in general.

I built a temporary cabin at the foot of DeBoulie Mountain, on the shore of DeBoulie Lake, for the watchman to live in, roofing it with bark and installing a telephone therein. I would suggest building a larger camp there and covering with shingles so as to store canoe, fire-fighting utensils, etc., at close of season.



A good trail has been cleared out from the foot of DeBoulie Mountain to the top, where the watchman had a temporary lookout in the trees, which answered the purpose very well for this year.

The steel tower for the DeBoulie Mountain lookout station, and other materials for building the same, were started en route for the mountain, but too late to get there last spring; therefore the work was put over until this fall. As soon as the lakes freeze up I would recommend that the work be completed.

I would also suggest that the patrolman's camp on Wallagrass Lake should be moved to higher ground at the head of first lake, where there is a never-failing spring of water. The reason for this is, that the American Realty Company has built a large dam at the foot of the lake that flows the water nearly over the floor of the camp at present. This could be moved with small cost in the early fall when the lake is frozen over. One pair of horses could haul it to the new site.

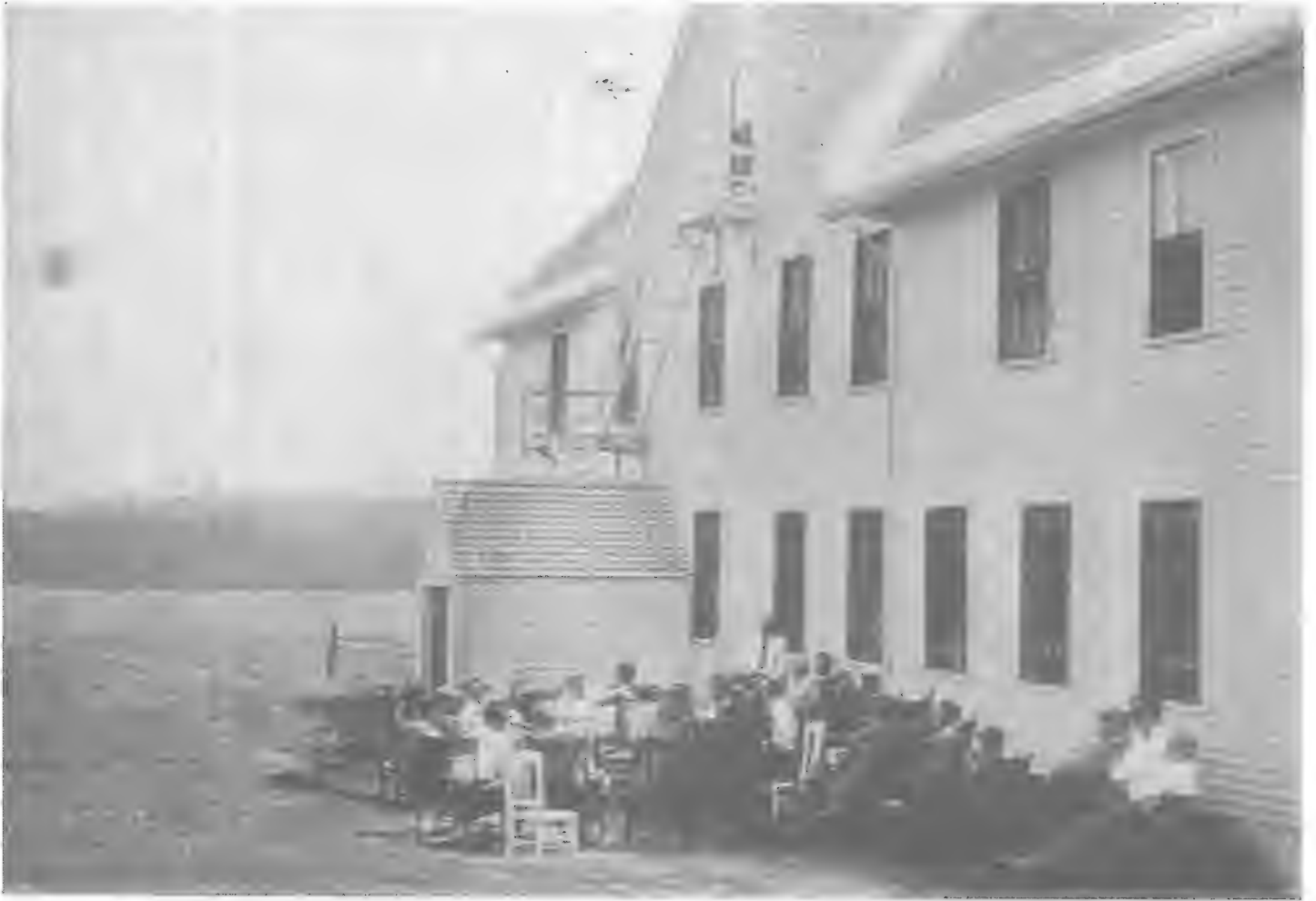
Frank P. Conley, Chief Warden, Greenville Jct., Moosehead Lake Region. District No. 1.

There have been three lookout stations in operation in my district this season. Squaw Mountain station has been greatly improved by the erection of a modern steel tower, 20 feet high, placed on the highest peak. This gives the lookout man a better view of Indian Stream Town and Big Indian Pond. I recommend six miles of telephone wire for a metallic line for Squaw Mountain, as our telephone service is very poor.

I recommend a 40-foot steel tower for Lily Bay Mountain, to be put up first thing next spring. Wire, insulators and brackets should be sent to Greenville some time during the winter for Squaw Mountain.

Frank W. Hilton, Chief Warden, Upper Kennebec Regions. District No. 4.

Although there have been several small fires along the railroad, I have had but one bad fire in my territory during the season. This occurred at Chase Stream and was quite a bad one on account of the high winds and its being so far away from men. The help used to extinguish this was almost wholly Preble & Robinson's crews of lumbermen. The smaller fires along the railroad have been almost wholly taken care of by the railroad men, except one at Misery Siding which deputy warden Daniel Burns, with a crew of log-drivers, took care of. There was a small fire July 3 on



**MEETING OF THE ASSOCIATION OF EASTERN FORESTERS IN THE  
MOOSEHEAD REGION.**

On July 17, 18 and 19, 1919, the members of this Association were assembled at Pittston Farm. Eleven of the Eastern States and three of the Canadian Provinces were represented. The picture was taken while the discussion of Mr. Graves' National program of Forestry was going on.

Photo by Maine Forestry Dept.



**MEMBERS OF THE EASTERN FORESTERS ASSOCIATION.**

Studying conditions in the woods at Pittston. Secondary growth of spruce and fir under hardwood cover is occupying their attention.

Photo by Maine Forestry Dept.

Bald Mountain town which was taken care of by Hollingsworth & Whitney men.

The improvements in my territory the past season have been the erection of a 12-foot steel tower on Moxie Bald Mountain, No. 23, to replace the old wooden one, and we have also erected at Troutdale a new State camp, 18 ft. by 24 ft., for the telephones and telephone operator. This is a three-room camp, painted white, and has a veranda.



PIGS IN THE LUMBER CAMP

The unsightly garbage heap that used to repose under the cook-room window has vanished since the pig came to the lumber camp. Where a few pigs are kept the refuse from the cook-room goes a long ways toward their maintenance. Thus a certain amount of waste is eliminated.

Photo by C. W. Grover.

The worst thing I have had to contend with the past season has been "campers" during the fishing and berry seasons.

In my opinion the big fire on Chase Stream was caused by fishermen.

The telephone service has been very good this season.

J. B. Comber, Caratunk, Chief Warden, East Side Kennebec River, Somerset County. District No. 3.

In regard to fire protection for the Maine Forestry District during the past season will say that while there were frequent

showers during the season, it would be called a very dry summer.

My territory was posted with fire notices, the telephone lines were put in good condition, the lookout men were well furnished with equipment, and all the trails were rebushed out. The tower on Mount Coburn and also the tower on Pleasant Pond Mountain, were each newly painted. The State boat at Pleasant Pond was painted and a new set of oars and oar-locks were purchased for the same.

We built a camp 10 by 12 feet at the foot of Mount Coburn lookout station and installed a new telephone instrument in it, as there are windy days when it is very difficult for the watchman to hear from the tower. Wherever tools were lacking in the tool boxes they have been replaced by new ones, although most of the boxes in this section were well supplied. We had only two small fires in my territory this season, with very little expense.

People who travel in the woods in general seem to be getting educated more and more each year in regard to being careful with fire.



## Laws Pertaining to Forest Fire Protection.

REVISED STATUTES, CHAPTER 8, Section 60, as Amended by Chapter 138, Public Laws of 1917, and Chapter 104, Public Laws of 1919.

The administrative district known as the Maine Forestry District, heretofore established and incorporated, shall include the following territory:

Township A, R. 2, W. E. L. S.; Hammond Plantation; C, R. 2, W. E. L. S.; D, R. 2, W. E. L. S.; E. Plantation; 3, R. 2, W. E. L. S.; Cox Patent; Macwahoc Plantation; Glenwood Plantation; 3, R. 3, W. E. L. S.; 4, R. 3, W. E. L. S.; 7, R. 3, W. E. L. S.; 8, R. 3, W. E. L. S.; 9, R. 3, W. E. L. S.; 10, R. 3, W. E. L. S.; 17, R. 3, W. E. L. S.; 1, R. 4, W. E. L. S.; 2, R. 4, W. E. L. S.; 3, R. 4, W. E. L. S.; 7, R. 4, W. E. L. S.; 8, R. 4, W. E. L. S.; 9, R. 4, W. E. L. S.; 10, R. 4, W. E. L. S.; 11, R. 4, W. E. L. S.; Westmanland Plantation; 16, R. 4, W. E. L. S.; 17, R. 4, W. E. L. S.; A, R. 5, W. E. L. S.; 1, R. 5, W. E. L. S.; 7, R. 5, W. E. L. S.; 8, R. 5, W. E. L. S.; 9, R. 5, W. E. L. S.; 13, R. 5, W. E. L. S.; 14, R. 5, W. E. L. S.; 15, R. 5, W. E. L. S.; 16, R. 5, W. E. L. S.; 17, R. 5, W. E. L. S.; Oxbow Plantation; 10, R. 6, W. E. L. S.; Garfield Plantation; Nashville Plantation; 14, R. 6, W. E. L. S.; 15, R. 6, W. E. L. S.; 16, R. 6, W. E. L. S.; 9 R. 7, W. E. L. S.; 10, R. 7, W. E. L. S.; 11, R. 7, W. E. L. S.; 12, R. 7, W. E. L. S.; 13, R. 7, W. E. L. S.; 14, R. 7, W. E. L. S.; Winterville Plantation; Eagle Lake; 9, R. 8, W. E. L. S.; 10, R. 8, W. E. L. S.; 11, R. 8, W. E. L. S.; 12, R. 8, W. E. L. S.; 13, R. 8, W. E. L. S.; 14, R. 8, W. E. L. S.; 15, R. 8, W. E. L. S.; 16, R. 8, W. E. L. S.; 11, R. 9, W. E. L. S.; 12, R. 9, W. E. L. S.; 13, R. 9, W. E. L. S.; 14, R. 9, W. E. L. S.; 15, R. 9, W. E. L. S.; 16, R. 9, W. E. L. S.; 11, R. 10, W. E. L. S.; 12, R. 10, W. E. L. S.; 13, R. 10, W. E. L. S.; 14, R. 10, W. E. L. S.; 15, R. 10, W. E. L. S.; Allagash Plantation; 18, R. 10, W. E. L. S.; 11, R. 11, W. E. L. S.; 12, R. 11, W. E. L. S.; 13, R. 11, W. E. L. S.; 14, R. 11, W. E. L. S.; 15, R. 11, W. E. L. S.; 18, R. 11, W. E. L. S.; 19, R. 11, W. E. L. S.; 11, R. 12, W. E. L. S.; 12, R. 12, W. E. L. S.; 13, R. 12, W. E. L. S.; 14, R. 12, W. E. L. S.; 15, R. 12, W. E. L. S.; 16, R. 12, W. E. L. S.; 17, R. 12, W. E. L. S.; 18, R. 12, W. E. L. S.; 19, R. 12, W. E. L. S.; 20, R. 11 & 12, W. E. L. S.; 11, R. 13, W. E. L. S.; 12, R. 13, W. E. L. S.; 13, R. 13, W. E. L. S.; 14, R. 13, W. E. L. S.; 15, R. 13, W. E. L. S.; 16, R. 13, W. E. L. S.; 17, R. 13, W. E. L. S.; 18, R. 13, W. E. L. S.; 11, R. 14, W. E. L. S.; 12, R. 14, W. E. L. S.; 13, R. 14, W. E. L. S.; 14, R. 14, W. E. L. S.; 15, R. 14, W. E. L. S.; 16, R. 14, W. E. L. S.; 17, R. 14, W. E. L. S.; 11, R. 15, W. E. L. S.; 12, R. 15, W. E. L. S.; 13, R. 15, W. E. L. S.; 14, R. 15, W. E. L. S.; 15, R. 15, W. E. L. S.; 11, R. 16, W. E. L. S.; 12, R. 16, W. E. L. S.; 13, R. 16, W. E. L. S.; 14, R. 16, W. E. L. S.; 11, R. 17, W. E. L. S.; 12, R. 17, W. E. L. S., in Aroostook County.

Township No. 4, Washington Plantation; Sandy River Plantation; Rangeley Plantation; 4, R. 1, B. K. P., W. K. R.; 4, R. 2, B. K. P., W. K. R.; 4, R. 3, B. K. P., W. K. R.; D, R. 1; 1, R. 2, W. B. K. P.; Dallas Plantation; Coplin Plantation; Lang Plantation; 3, R. 3, W. B. K. P.; 3, R. 2, B. K. P., W. K. R.; 2, R. 4, W. B. K. P.; 3, R. 4, W. B. K. P.; 1, R. 5, W. B. K. P.; 2, R. 5, W. B. K. P.; 3, R. 5, W. B. K. P.; 1, R. 6, W. B. K. P.; 2, R. 6, W. B. K. P.; 3, R. 6,

W. B. K. P.; 1, R. 7, W. B. K. P.; 2, R. 7, W. B. K. P.; 1, R. 8, W. B. K. P.; 2, R. 8, W. B. K. P.; Gore North of T. No. 2 and 3, R. 6, W. B. K. P.; No. 6 North of Weld; Gore North of T. 1, R. 8, W. B. K. P.; Township E; Perkins; in Franklin County.

Township No. 3, North Division; No. 4, North Division; Two Mile Strip North of No. 3, North Division; Strip North of No. 4, North Division; No. 7, South Division; No. 8 Plantation; No. 9, South Division; No. 10, South Division; No. 16, Middle Division; No. 21 Plantation; No. 22, Middle Division; No. 28, Middle Division; No. 32, Middle Division; No. 33 Plantation; No. 34, Middle Division; No. 35, Middle Division; No. 39, Middle Division; No. 40, Middle Division; No. 41, Middle Division; Butter Island; Eagle Island; Spruce Head Island; Bear Island; Beach Island; Hog Island; Bradbury's Island; Pond Island; Western Island; Little Spruce Island; Marshall's Island; Pickering's Island; Resolution Island; in Hancock County.

T. A, No. 1; Andover North Surplus; Andover West Surplus; T. C.; C. Surplus; 4 R. 1, W. B. K. P.; Magalloway Plantation; 4, R. 2, W. B. K. P.; Lincoln Plantation; 4, R. 3, W. B. K. P.; 5, R. 3, W. B. K. P.; 4, R. 4, W. B. K. P.; 5, R. 4, W. B. K. P.; 4, R. 5, W. B. K. P.; 4, R. 6, W. B. K. P.; 5, R. 5, W. B. K. P.; Grafton; in Oxford County.

Township 3, R. 1, N. B. P. P.; Lakeville Plantation; 5, R. 1, N. B. P. P.; Webster Plantation; Drew Plantation; 1, R. 7, N. W. P.; 2, R. 8, N. W. P.; Seboeis Plantation; 2, R. 9, N. W. P.; 3, R. 9, N. W. P.; 1, R. 6, W. E. L. S.; 2, R. 6, W. E. L. S.; Stacyville Plantation; 6, R. 6, W. E. L. S.; 7, R. 6, W. E. L. S.; 8, R. 6, W. E. L. S.; A, R. 7, W. E. L. S.; 1, R. 7, W. E. L. S.; 2, R. 7, W. E. L. S.; 3, R. 7, W. E. L. S.; 4, R. 7, W. E. L. S.; 5, R. 7, W. E. L. S.; 6, R. 7, W. E. L. S.; 7, R. 7, W. E. L. S.; 8, R. 7, W. E. L. S.; Hopkins Academy Grant; 8, R. 8, W. E. L. S.; A, R. 8 & 9, W. E. L. S.; Veazie Gore; No. 3, Indian Purchase; No. 4, Indian Purchase; 1, R. 8, W. E. L. S.; 2, R. 8, W. E. L. S.; 3, R. 8, W. E. L. S.; 4, R. 8, W. E. L. S.; 5, R. 8, W. E. L. S.; 6, R. 8, W. E. L. S.; 7, R. 8, W. E. L. S.; No. 1, North Division; Grand Falls Plantation; in Penobscot County.

Lakeview Plantation; Barnard Plantation; 4, R. 9, N. W. P.; 5, R. 9, N. W. P.; 6, R. 9, N. W. P.; 7, R. 9, N. W. P.; Elliottsville Plantation; 3, R. 5, B. K. P., E. K. R.; 2, R. 6, B. K. P.; E. K. R.; 1, R. 9, W. E. L. S.; 2, R. 9, W. E. L. S.; 3, R. 9, W. E. L. S.; 4, R. 9, W. E. L. S.; 5, R. 9, W. E. L. S.; 6, R. 9, W. E. L. S.; 7, R. 9, W. E. L. S.; 8, R. 9, W. E. L. S.; 9, R. 9, W. E. L. S.; 10, R. 9, W. E. L. S.; A, R. 10, W. E. L. S.; B, R. 10, W. E. L. S.; 1, R. 10, W. E. L. S.; 2, R. 10, W. E. L. S.; 3, R. 10, W. E. L. S.; 4, R. 10, W. E. L. S.; 5, R. 10, W. E. L. S.; 6, R. 10, W. E. L. S.; 7, R. 10, W. E. L. S.; 8, R. 10, W. E. L. S.; 9, R. 10, W. E. L. S.; 10, R. 10, W. E. L. S.; A, R. 11, W. E. L. S.; B, R. 11, W. E. L. S.; 1, R. 11, W. E. L. S.; 2, R. 11, W. E. L. S.; 3, R. 11, W. E. L. S.; 4, R. 11, W. E. L. S.; 5, R. 11, W. E. L. S.; 6, R. 11, W. E. L. S.; 7, R. 11, W. E. L. S.; 8, R. 11, W. E. L. S.; 9, R. 11, W. E. L. S.; 10, R. 11, W. E. L. S.; 7, R. 10, N. W. P.; 8, R. 10, N. W. P.; A, R. 12, W. E. L. S.; 1, R. 12, W. E. L. S.; 2, R. 12, W. E. L. S.; 3, R. 12, W. E. L. S.; 4, R. 12, W. E. L. S.; 5, R. 12, W. E. L. S.; 6, R. 12, W. E. L. S.; 7, R. 12, W. E. L. S.; 8, R. 12, W. E. L. S.; 9, R. 12, W. E. L. S.; 10, R. 12, W. E. L. S.; A, R. 13, W. E. L. S.; A, 2, R. 13 & 14, W. E. L. S.; 1, R. 13, W. E. L. S.; 2, R. 13, W. E. L. S.; 3, R. 13, W. E. L. S.; 4, R. 13, W. E. L. S.; 5, R. 13, W. E. L. S.; 6, R. 13, W. E. L. S.; 7, R. 13, W. E. L. S.; 8, R. 13, W. E. L. S.;



9, R. 13, W. E. L. S.; 10, R. 13, W. E. L. S.; A, R. 14, W. E. L. S.; X, R. 14, W. E. L. S.; 1, R. 14, 3, R. 14 & 15, W. E. L. S.; 4, R. 14, W. E. L. S.; 5, R. 14, W. E. L. S.; 6, R. 14, W. E. L. S.; 7, R. 14, W. E. L. S.; 8, R. 14, W. E. L. S.; 9, R. 14, W. E. L. S.; 10, R. 14, W. E. L. S.; Sugar Island; Deer Island; Middlesex Canal; Day's Academy; 4, R. 15, W. E. L. S.; 5, R. 15, W. E. L. S.; 6, R. 15, W. E. L. S.; 7, R. 15, W. E. L. S.; 8, R. 15, W. E. L. S.; 9, R. 15, W. E. L. S.; 10, R. 15, W. E. L. S.; Moose Island; Farm Island; Dollar Island; Ledge Island; Birch Island; both Moody Islands; Cove Point; Harford's Point; Kingsbury Plantation; in Piscataquis County.

Lexington Plantation; Pleasant Ridge Plantation; Highland Plantation; 1, R. 3, B. K. P., W. K. R.; 2, R. 3, B. K. P., W. K. R.; Dead River Plantation; Bigelow Plantation; 1, R. 4, B. K. P., W. K. R.; 2, R. 4, B. K. P., W. K. R.; 3, R. 4, B. K. P., W. K. R.; Flagstaff Plantation; West Forks Plantation; 2, R. 5, B. K. P., W. K. R.; 3, R. 5, B. K. P., W. K. R.; 4, R. 5, B. K. P., W. K. R.; 1, R. 6, B. K. P., W. K. R.; 2, R. 6, B. K. P., W. K. R.; 3, R. 6, B. K. P., W. K. R.; 4, R. 6, B. K. P., W. K. R.; 5, R. 6, B. K. P., W. K. R.; 1, R. 7, B. K. P., W. K. R.; 2, R. 7, B. K. P., W. K. R.; 3, R. 7, B. K. P., W. K. R.; 4, R. 7, B. K. P., W. K. R.; 5, R. 7, B. K. P., W. K. R.; 6, R. 7, B. K. P., W. K. R.; Gore North of Nos. 1, 2 & 3, R. 7, B. K. P., W. K. R.; Mayfield Plantation; 2, R. 3, B. K. P., E. K. R.; The Forks Plantation; 2, R. 4, B. K. P., E. K. R.; 1, R. 5, B. K. P., E. K. R.; 2, R. 5, B. K. P., E. K. R.; 1, R. 6, B. K. P., E. K. R.; 1, R. 1, N. B. K. P.; 2, R. 1, N. B. K. P.; 3, R. 1, N. B. K. P.; Jackman Plantation; 5, R. 1, N. B. K. P.; 6, R. 1, N. B. K. P.; 1, R. 2, N. B. K. P.; 2, R. 2, N. B. K. P.; 3, R. 2, N. B. K. P.; Moose River Plantation; Dennistown Plantation; 6, R. 2, N. B. K. P.; Big W, N. B. K. P.; Little W, N. B. K. P.; 1, R. 3, N. B. K. P.; 2, R. 3, N. B. K. P.; 3, R. 3, N. B. K. P.; 4, R. 3, N. B. K. P.; 5, R. 3, N. B. K. P.; Seboomook; 1, R. 4, N. B. K. P.; 2, R. 4, N. B. K. P.; 3, R. 4, N. B. K. P.; 4, R. 4, N. B. K. P.; 5, R. 4, N. B. K. P.; 3, R. 5, N. B. K. P.; 4, R. 5, N. B. K. P.; 4, R. 16, W. E. L. S.; 5, R. 16, W. E. L. S.; 6, R. 16, W. E. L. S.; 7, R. 16, W. E. L. S.; 8, R. 16, W. E. L. S.; 9, R. 16, W. E. L. S.; 10, R. 16, W. E. L. S.; 4, R. 17, W. E. L. S.; 5, R. 17, W. E. L. S.; 6, R. 17, W. E. L. S.; 7, R. 17, W. E. L. S.; 8, R. 17, W. E. L. S.; 9, R. 17, W. E. L. S.; 10, R. 17, W. E. L. S.; 4, R. 18, W. E. L. S.; 5, R. 18, W. E. L. S.; 6, R. 18, W. E. L. S.; 7, R. 18, W. E. L. S.; 8, R. 18, W. E. L. S.; 9, R. 18, W. E. L. S.; 5, R. 19, W. E. L. S.; 6, R. 19, W. E. L. S.; 7, R. 19, W. E. L. S.; 8, R. 19, W. E. L. S.; 5, R. 20, W. E. L. S.; Caratunk Pl.; Moscow; Sandbar Tract; in Somerset County.

Township No. 18, East Division; No. 19, East Division; No. 26, East Division; No. 27, East Division; No. 18, Middle Division; No. 19, Middle Division; No. 24, Middle Division; No. 25, Middle Division; No. 29, Middle Division; No. 30, Middle Division; No. 31, Middle Division; No. 36, Middle Division; No. 37, Middle Division; No. 42, Middle Division; No. 43, Middle Division; No. 5, North Division; Strip North of No. 5, North Division; No. 6, North Division; Strip North of No. 6, North Division; No. 1, R. 1, Titcomb's Survey; Grand Lake Stream Plantation; 1, R. 2, Titcomb's Survey; 1, R. 3, Titcomb's Survey; 6, R. 1, N. B. P. P.; 7, R. 2, N. B. P. P.; 8, R. 3, N. B. P. P.; 10, R. 3, N. B. P. P.; 11, R. 3, N. B. P. P.; 8, R. 4, N. B. P. P.; Indian Township; Codyville Plantation; No. 14 Plantation; No. 21 Plantation; Edmunds; Brookton; Cooper; Beddington; Wesley; in Washington County.

Section 61. An annual tax of 1 3-4 mills on the dollar is hereby assessed upon all the property in said district, including rights in public lots, to be used for the protection thereof. Said tax shall be due and payable at the date of the assessment of the State tax, in the years when the legislature is in session, and for other years it shall be due and payable in one year after the date of such assessment.

The valuation as determined by the board of state assessors, and set forth in the statement filed by them, as provided in section eleven, of chapter 9, shall be the basis for the computation and apportionment of the tax hereby assessed.

The tax hereby assessed shall be valid, and all remedies herein provided shall be in full force if said property is described with reasonable accuracy, whether the ownership thereof is correctly stated or not.

Section 62. The board of state assessors shall within thirty days after such tax is due, prepare and file with the treasurer of the state, a certificate setting forth the description of each lot, parcel or right subject to the tax, together with the tax computed at the rate fixed in the preceding section.

Section 63. The treasurer of the state shall cause lists of the assessments made hereby to be advertised for three weeks successively in the State paper, and in some newspaper, if any, in the county where the land lies, within three months after such tax is due. Such advertisement may be consolidated with the advertisement required by Section 44 of Chapter 10.

The land shall be held to the State for the payment of the tax so assessed, with interest at twenty per cent per annum, to commence six months after such tax is due as herein provided.

Section 64. Owners of lands so assessed and advertised may redeem them by paying to the treasurer of the state the tax with interest thereon, within one year from the time when such interest commences. Each owner may pay for his interest in any tract, whether in common or not, and upon filing with the Treasurer of state a certificate showing the number of acres and describing the property on which he desires to pay the tax, and where the same is located, and paying the amount due, shall receive a certificate from the treasurer of the state, discharging the tax on the number of acres or interest upon which such payment is made.

Each part or interest of every such township or tract upon which the tax hereby imposed so advertised is not paid, with interest, within the time limited in this section for such redemption, shall be wholly forfeited to the state and vest therein free of any claim by any former owner.

Section 65. The treasurer of state shall annually send his warrant, together with a copy of the assessment of taxes upon the organized plantations in the Maine Forestry District, directed to the municipal officers of said plantations, requiring them respectively to assess in dollars and cents, the sum so charged, according to the provisions of law for the assessment of such taxes, and to add to the amount of such tax the amount of State, county and plantation taxes, to be by them assessed in each plantation respectively.

Section 66. The tax assessed by authority of Section 61 shall be held by the Treasurer of State as a fund to be used to protect from fire the forests situated upon and within the district and to pay expenses incidental thereto and for no other purpose.

The governor and council shall from time to time, as the forest commissioner may request, issue their warrant to the Treasurer of State to pay to said commissioner such sums of money as said commissioner may deem necessary for the purpose aforesaid.

If the tax assessed by authority of Sec. 61 has not been collected or for any other reason is not available for the purpose aforesaid or if said tax proves insufficient in any year to properly carry out said purpose the governor and council may issue their warrant to the Treasurer of State authorizing him to advance and pay to the forest commissioner from any moneys then in the treasury not otherwise appropriated, such sum or sums of money as they may deem necessary for such purpose.

The accounts of the commissioner of the disbursement of all funds shall be examined by the state auditor for the purpose of determining if said accounts are correctly kept and all payments properly vouched for.

The forest commissioner may employ from time to time such clerks in his office as will enable him to pay promptly, all bills contracted in carrying out the provisions thereof; the compensation of such clerks shall be paid from the funds provided for the district.

Section 67. The forest commissioner shall take measures for the prevention, control and extinguishment of forest fires in said forestry district, and to this end he shall establish such sub-forestry districts as he may deem necessary for effective protection against loss or damage by fire. He may establish lookout stations connected by telephone, and equip and maintain depots for necessary tools for the extinguishment of forest fires.

Section 68. He shall appoint in and for each of the districts so established, a chief forest fire warden, and such number of deputy forest fire wardens as in his judgment may be required to carry out the provisions of Sections 60 to 73, both inclusive, assigning to each of the latter the territory over and within which he shall have jurisdiction. All chief and deputy forest fire wardens, so appointed, shall hold office during the pleasure of the commissioner; they shall be sworn to the faithful discharge of their duties and a certificate thereof shall be returned to the office of the commissioner.

Section 69. The chief forest fire wardens, under the direction of the commissioner, shall have general supervision of their respective districts and of the deputy forest fire wardens therein. Each chief forest fire warden, when directed by the commissioner, shall patrol the forest of his district for the purpose of searching out, extinguishing and guarding against forest fires. He shall investigate and gather evidence regarding the causes of forest fires, enforce all laws relating to forests and forest preservation, arrest all violators thereof, prosecute all offenses against the same, and in this connection shall have the same power to serve criminal processes against such offenders and shall be allowed the same fee as a sheriff, or his deputy, for like services, and shall have and enjoy the same right as a sheriff, to require aid in executing the duties of his office. The chief forest fire wardens shall perform such other duties, at such times, and under such rules and regulations, as the said commissioner may prescribe, and each shall receive as compensation three dollars for each and every day of actual service, with an allowance for actual necessary expenses of travel and subsistence. The commissioner may authorize the employment of suitable persons to assist the chief forest fire wardens in patrolling their respective districts and every person so employed shall be paid



#### UNIT CAMPS.

Photo by Maine Forestry Dept.

Beginning at the left—the first is the cookroom and eating camp; the next three are sleeping camps, each with equipment for twenty men, including steel bunks, mattresses and springs; at the extreme right is the office and scalers' camp. This arrangement has many advantages over the old style lumber camp.



Outlet Dam.

Photo by J. F. Philippi.



Blakesly Pond.

Photo by Maine Forestry Dept.

twenty cents for each hour of service so rendered by him and be provided by subsistence during such period. Deputy forest fire wardens shall perform such duties, at such times and under such rules and regulations, as the commissioner, or the chief fire warden of the district, with the approval of the commissioner, may prescribe and they shall receive as compensation two dollars and actual necessary expenses for each and every day of actual service.

Section 70. Whenever a fire occurs on, or is likely to do damage to forest lands within the district of any chief forest fire warden, he shall take immediate action to control and extinguish the same. If such fire occurs upon or is likely to do damage to forest lands within the territory of a deputy forest fire warden and the chief fire warden of the district is not present, the deputy forest fire warden having jurisdiction of the territory shall forthwith proceed to control and extinguish the same, and he shall meanwhile, with all consistent dispatch, cause the said chief fire warden of the district to be notified of the occurrence of such fire. Until the arrival of the chief warden at the place of fire, the deputy warden shall be in charge of the control and extinguishment of the same. For the purpose of controlling and extinguishing fires, chief forest fire wardens, and deputy forest fire wardens, when in charge of the control and extinguishment of forest fires or when so directed by the chief warden, may summon to their assistance any person found within the State and each person so summoned and assisting shall be paid twenty cents for each hour of service rendered by him and be provided with subsistence during such service. Immediately after the extinguishment of a fire, the deputy forest fire warden who for any time may have been in charge of the same, shall make return to the chief warden of the district of the expense thereof during the period of his being in charge, including the names of the persons so summoned and assisting, with their postoffice addresses and the hours of labor actually performed by each under his direction. The return shall be made upon oath and the chief warden is hereby authorized and empowered to administer such oath. Upon receipt of such return, the chief fire warden shall carefully examine and audit the same and he may direct the deputy to amend and correct any return found to be incomplete, incorrect, or insufficient in form. If upon examination and auditing of said return, and investigation of the subject matter thereof, the chief fire warden believes said return to be just and correct, he shall endorse his written approval thereon and forward the same so approved to the forest commissioner. The chief fire warden of every district burned by a forest fire shall, upon the extinguishment of such fire, promptly forward an exact and detailed statement of the expense, if any, which he may have incurred in connection with the extinguishment of such fire, to the forest commissioner, who may confirm, reject or recommit either or both the approved return of said deputy or the detailed statement of the chief fire warden if justice so requires.

Section 71. All expenses incurred under the provisions of sections 60 to 73, both inclusive, shall be paid from the funds raised and created under the provision of section 61.

Section 72. For the purpose of the better carrying out the provisions of this act it is hereby provided that the chief clerk of the land agent shall be a deputy forest commissioner. The said deputy forest commissioner shall hold office during the pleasure of the forest commissioner and perform such duties as the latter may prescribe. For such services the deputy forest commissioner

shall receive annually the sum of seven hundred dollars, to be paid from the funds provided under this act, in addition to the salary now provided for the clerk to the land agent. It is also hereby further provided that the forest commissioner shall receive from the funds provided under this act, the sum of two thousand dollars per year in addition to the salary now provided by law.

Section 73. So much of the funds raised by the tax hereby imposed and paid into the treasury as may be necessary to pay the claims, accounts and demands arising under the provisions of the twelve preceding sections is hereby appropriated to pay the same, and the governor and council may draw their warrants therefor at any time. Any balance remaining unpaid shall continue from year to year as a fund available for the purpose defined in section 61.

Section 74. Any incorporated town or organized plantation adjoining any part of the Maine forestry district may by vote at any meeting of its inhabitants duly called and held, become a part of said forestry district and subject to all the provisions of the thirteen preceding sections. A copy of such vote certified by the town clerk or plantation assessors, shall be forwarded forthwith to the Treasurer of State and to the State forest commissioner, and from the time such certified copy is filed in the office of the Treasurer of State, the town or plantation so voting shall be and continue a part of said forestry district. All incorporated towns or organized plantations which shall become a part of said district and all officers of such towns or plantations shall be and are exempt from the duties and obligations imposed by sections 29 and 36 of this chapter.







A REAR VIEW.

A pair of rascals with a number of aliases such as porcupine, hedgehog, quillpig, etc. They might well be ashamed to face the camera as they are to be considered enemies of the forests by reason of their damaging young growth. Also they have a vicious way of girdling hardwoods.

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**Fire Protection**

**Outside Maine Forestry District**

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### THE CARRYING PLACE.

An historic spot on the upper Kennebec, as it was at this point that Benedict Arnold, on his unsuccessful expedition against Quebec, left the river and started overland through the wilderness of the Maine Woods.

Photo by Maine Forestry Dept.

# FIRE PROTECTION

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## LOOKOUT STATIONS.



THE lookout stations on Agamenticus Mountain and Ossipee Hill, on which steel towers were erected last fall, were connected with the system of the New England Telephone & Telegraph Company. These stations were opened early in May and kept open until early in October. Under an agreement with the United States Forest Service the salary of the watchmen on these two stations was paid two-thirds by the Service and one-third by the State. There were thirty-four fires reported by the watchman on Agamenticus Mountain, and twenty-one

fires by the watchman on Ossipee Hill. Although the lookout system outside the Maine Forestry District is not yet perfected, we are satisfied with the results obtained so far.

## WARDENS

According to the present law, the selectmen of the towns are Forest Fire Wardens, and have the whole responsibility of fire protection in their respective towns. Knowing these men to be very busy and not having much time to attend to the details of forest protection, it was thought advisable by this department to

ask the selectmen to appoint a deputy forest fire warden, who would have full charge of forest fires in the towns for which they were appointed. Accordingly the following letter was written to the Selectmen of the different towns in the State.

March 27, 1919.

To the Honorable Board of Selectmen:  
Gentlemen:

The forest and wood lot fire season seems to be very close at hand. I am enclosing a copy of the law in regard to forest fires



SALVAGING MERCHANTABLE TIMBER IN  
BURNED LAND.

The timber is black and the workers soon resemble Africans in color. Photo by Maine Forestry Dept.

in the organized towns of our State. You will note that the Selectmen of the organized towns are the Forest Fire Wardens for such towns. Please note that Fire Wardens in organized towns do not have supervision over forest fires. I respectfully call your attention to that part of the Law which pertains to the negligence of Selectmen and their liability for damages if they do not attend to their duty in this respect. It has been suggested to me that in cases

where the Selectmen do not have the time to attend to this duty that they appoint one or more men, to be known as Deputy Forest Fire

Wardens, who have telephone connection and own an automobile, and are interested in the forests and wood lots, to be their representatives in looking after these matters and **TAKING CHARGE OF THE WORK** in the case of forest fires. Please impress upon these men the importance of being very prompt to act when notified of fire starting in their locality, and the importance of being within telephone communication through the dry season, giving the local operator the number where they can be called. Report to this department any Deputies appointed by you; or in case you do not appoint Deputies please let us know the name of the Selectmen in charge of forest fires.

I would also call to your attention that according to reports of this office the fire loss in the Maine Forestry District, meaning outside of the organized towns, for the season of 1918 was \$7,291.20, while in the organized towns, meaning the towns not in the Maine Forestry District, it was \$70,600.00. I believe if proper care and attention is given this forest fire problem by the Selectmen of the towns that there is no reason why



Pulp Wood Piled in Burned Land.

Photo by Maine Forestry Dept.



the fire loss outside of the Maine Forestry District should be any larger than it is within the Maine Forestry District.

I am not writing this letter to find fault with any town official but simply to bring the matter home to you that we may coöperate to the best possible advantage and do everything we can to eliminate forest fires from our State this season.

Any advice or assistance that we can render we shall be glad to do.

Very truly yours,

(Signed)

FORREST H. COLBY,  
*Forest Commissioner.*

In accordance with this letter, deputy wardens were appointed in the following towns: Lebanon, Fryeburg, Cornish, Cumberland, Monson, Cornville, Searsport, Limerick, and Gorham. Arthur A. Ramsdell of York and C. W. Fluent of Cornish Center were appointed watchmen for Agamenticus and Ossipee Mountains respectively. The watchman on Ossipee reported during the season 21 fires and the watchman on Agamenticus reported 34 fires. An agreement was reached with the U. S. Forest Service whereby the watchmen were paid two-thirds by the Service and one-third by this department. The money used by the department to pay these watchmen was taken from the appropriation for general forestry purposes. Steel has been purchased for two forty-eight-foot towers to be placed on Cedar Mountain in the town of Parsonsfield and Pleasant Mountain in the town of Denmark. These four stations will cover all of York County, part of Cumberland and all that part of Oxford County not covered by the lookout stations in the Maine Forestry District.

#### SLASH

Warren C. Merrill of Skowhegan was appointed inspector to look after slash enforcement. As soon as the appropriation for general forestry purposes became available, which was on July 4th, a Ford car was purchased and turned over to the inspector, who, from that time until September 17th, when he finished to return to college, had travelled six thousand two hundred and six miles, covering nearly all the roads in York, Cumberland, Sagadahoc, Lincoln, Kennebec, Somerset, and the south part of Oxford and Franklin. There were many places where the slash was very bad and as the weather was very dry it was thought advisable not

to burn; but to have the slash piled in these bad places and ready to burn in the fall on the first snow. This fall the following letter was written to the Selectmen in regard to disposal of slash at this time.

To The Selectmen:

Many times last summer during the dangerous dry period we had inquiries in regard to the disposal of slash. We have advised in all cases to pile the brush and wait for a favorable time to burn it. In the central and lower part of the State it is now the



SLASH DISPOSAL.

Photo by Maine Forestry Dept.

All slash has been piled and burned.

most favorable time to burn Slash. We favor this time of the year as the first light snows are beginning to fall and there is no danger of the fire escaping; and the slash burns much better than in the early spring. In the springtime you will find that the inside of the pile remains so damp that it will not burn well; or if it does burn it will require a great deal of time and work.

We do not mean to dictate to you but we do want to refresh your memory in regard to this work as we are very anxious to have all of the slash by the roadside disposed of this fall if possible. If you know of any slash in your town that has not been disposed of, a word from you to the parties leaving the same will do much for

the cause. We will appreciate it if you will give this your careful attention for the next few weeks.

Very truly yours,  
FORREST H. COLBY, *Forest Commissioner.*

The so-called Slash Law was amended by the last Legislature, requiring permits to burn brush from the Forest Commissioner. As the law did not come into effect until July 4th, only thirty-six permits were granted this season. The law was also amended requiring the Forest Commissioner to furnish to the Municipal Officers of all the towns and organized plantations of the State blank permits signed by him for the burning of brush and slash, and full authority was given to these officers to counter-sign and grant such permits signed by the Forest Commissioner. Books of twenty-five permits have been prepared and will be ready for distribution early next spring. Another amendment which was added to this law is the clause making any violation of the so-called slash law punishable by a fine of fifty dollars.

PATROL

George F. Granville was again commissioned as a patrolman covering section around Parsonsfield. He was paid out of the money donated to the department for that purpose by the Sokokis Lumber Company and from the appropriation for general forestry purposes.

FOREST FIRES

The damage done by forest fires outside of the Maine Forestry District was a great deal less this season than in 1918. The following tabulation gives the number of fires that were reported to this office by the Selectmen.

FOREST FIRES OUTSIDE OF THE MAINE FORESTRY DISTRICT.

TOWNSHIP	Date	Acres	Cause	Damage	
Monticello.....	June	2	60	Burning fallow	*
Greene.....	Aug.	10	8	Campers.....	*
Chapman.....	Aug.	6	3	Unknown.....	\$20.00
Yarmouth.....	May	15	2	Locomotive.....	*
Sebago.....	June	6	3	Portable mill.....	30.00
Sebago.....	May	29	40	Portable mill.....	none
Standish.....	April	23	40	Burning brush.....	200.00
Yarmouth.....	May	24	2	Portable mill.....	*
Standish.....	June	13	75	Unknown.....	25.00
No. Yarmouth.....	July	26	5	Wood choppers.....	100.00
Temple.....	Aug.	1	2	Lumbermen.....	none
Tremont.....	Aug.	15	2	Berry pickers.....	300.00
Brownfield.....	Aug.	2	300	Cigarette.....	300.00
Bowdoin.....	July	4	10	Saw mill.....	*
Cornville.....	April	20	75	Unknown.....	1,300.00
Baileyville.....	May	10	15	Unknown.....	200.00
Lebanon.....	July	30	1½	Cigarette.....	100.00
Lebanon.....	Aug.	2	5	Locomotive.....	50.00
North Berwick.....	July	29	20	Unknown.....	none
			668½		\$2,625.00



#### SLASH—FUEL FOR FOREST FIRES.

Fire protection is a first essential of forestry and fire protection of cut-over lands is absolutely necessary if we are to have growing timber to fill future demands. But great bodies of slash in cut-over lands make adequate protection of young growth almost impossible. Complete disposal of slash by burning or partial disposal by top lopping is frequently advocated. .

Photo by Maine Forestry Dept.



"Slash" left after lumbering.

Photo by Maine Forestry Dept.

SUMMARY OF FIRES OUTSIDE OF MAINE FORESTRY DISTRICT.

COUNTY.	Acreage.	Damage.
Aroostook.....	63	\$20.00
Androscoggin.....	8	*
Cumberland.....	167	355.00
Franklin.....	2	
Hancock.....	2	300.00
Oxford.....	300	300.00
Sagadahoc.....	10	
Somerset.....	75	1,300.00
Washington.....	15	200.00
York.....	26 1/2	150.00
	668 1/2	\$2,625.00

\* Not mentioned.  
Causes of Fires: Unknown, 5; Campers, 4; Lumbering, 6; Railroads, 2; Burning brush, 1; Total, 18.

FOREST FIRE LAWS OUTSIDE THE MAINE FORESTRY DISTRICT  
CHAPTER 8, REVISED STATUTES

Section 29. The selectmen of towns shall be forest fire wardens therein, and the services of such selectmen acting as said fire wardens shall be paid for at the same rate as is paid for their other official services. Whenever a fire is discovered, fire wardens shall take such measures as may be necessary for its control and extinguishment. For this purpose they may call upon any persons in the town for assistance, and such persons shall receive such compensation, not exceeding twenty cents per hour, as said selectmen may determine, the same to be paid by the town; provided that no town shall be holden to pay for extinguishing forest fires in any year an amount greater than two per cent. upon its valuation for purposes of taxation. If any person so ordered to assist and not excused from said service by said forest fire wardens on account of sickness, disability, or some important business or engagement shall neglect to comply with any such order he shall forfeit the sum of ten dollars, to be recovered in action of debt in the name and to the use of the town, by the treasurer thereof. If any person shall suffer damage from fire in consequence of the negligence or neglect of the selectmen of any town to perform the duties required by this section such person shall have an action on the case to recover from the town where the fire occurs to the amount of his damages so sustained not to exceed two per cent. of the valuation of said town. This section shall also apply to cities. The chief engineers of the fire departments of cities shall be forest fire wardens and shall have the same powers and duties in carrying out the provisions hereof as selectmen of towns.

Section 36. Selectmen shall erect in a conspicuous place at the side of every highway as they may deem proper, and at suitable distances alongside the rivers and lakes of the State frequented by camping parties, tourists, hunters and fishermen, in their respective towns, notices in large letters to be furnished by the forest commissioner substantially in the following form: "Camp fires must be totally extinguished before breaking camp, under penalty of not to exceed one month's imprisonment or one hundred dollars fine, or both as provided by law. \_\_\_\_\_, Forest Commissioner." The forest commissioner shall furnish owners of woodlands situated within this State when called upon so to do, notices of similar tenor to be posted at the expense of said owners upon their respective lands.

Section 42. Municipal officers in towns shall proceed immediately to a strict inquiry into the cause and origin of fires within woodlands; and in all cases where such fires are found to have originated from the unlawful act of any person, to cause the offender to be prosecuted without delay.

Section 43. The selectmen of towns in which a forest fire of more than one acre in extent has occurred, within a month shall report to the forest commissioner the extent of area burned over to the best of their information, together with the probable amount of property destroyed, specifying the value of timber as near as may be, and the amount of cord wood, logs, bark or other forest product, fencing, bridges and buildings that have been burned. They shall also report the causes of these fires if they can be ascertained, and the measure employed and found effective in checking their progress. Blanks for such reports shall be furnished by the forest commissioner at the expense of the State.







Old Growth Spruce on Tumbledown Mountain.

Photo by C. W. Grover.

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# **PUBLIC LANDS**

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### GOLD PROSPECTORS IN THE MAINE WOODS.

On several of Maine's small streams you can find "the color" if you skillfully manipulate the prospector's "pan".

Photo by Maine Forestry Dept.

# PUBLIC LANDS

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## NATIONAL FORESTS.



**J**UNE 30, 1919, the United States Forest Service had acquired, under the Weeks Law, 27,860 acres of land in this State which has been made part of the White Mountain National Forest. This land is all located in the County of Oxford and this County in 1918 received from the U. S. Forest Service \$247.08, which is twenty-five per cent of all money received from this Forest Reserve during that fiscal year, and in accordance with the Section in the U. S. Revised Statutes, Volume 35, Page 260, which reads as follows:

“That hereafter twenty-five per centum of all money received from each forest reserve during any fiscal year, including the year ending June thirtieth, nineteen hundred and eight, shall be paid at the end thereof by the Secretary of the Treasury to the State or Territory in which said reserve is situated, to be expended as the State or Territorial legislature may prescribe for the benefit of the public schools and public roads of the county or counties in which the forest reserve is situated:

Provided, That when any forest reserve is in more than one State or Territory or county the distributive share to each from the proceeds of said reserve shall be proportional to its area therein.”

In accordance with the above section the Legislature of 1919 passed the following Resolve: "The money received from the department of agriculture of the United States, under the resolve of congress approved May twenty-third, nineteen hundred and eight, amounting to two hundred and eighty-seven dollars and seven cents, is hereby transferred to the county treasurer of Oxford County."

This year \$446.50 has been received by this department from the same source, but as the resolve passed in 1919 is not applicable to this particular sum, the next legislature will be asked to pass a



WHITE COAL.

Photo by J. F. Philippi.

The water power going to waste in the Maine woods, if harnessed by hydro-electric plants, would furnish power for all New England.

general act taking care of all such moneys received. This amount has been turned over to the State Treasurer, who has deposited it in the savings bank at four per centum interest.

### SCHOOL LANDS

In accordance with the resolves passed in 1905, 1915, and 1919, parts of the public lots in Wallagrass Plantation, St. Francis Plantation, in Aroostook County, and Number 33 Plantation in Hancock County, have been lotted and will be sold to the actual settlers thereon as soon as a fair settlement can be made.

Under resolve passed by the legislature of 1903 this department has sold to J. Lewis York of Rangeley one hundred acres of land located in the so called Minister Lot in Dallas Plantation.

Permits to cut timber have been granted on the Public Lots of the following plantations: Staceyville (2), New Canada, St. John, Elliottsville, Hammond (2), Hamlin (2), Macwahoc, The Forks (2), Lang, Dennistown, Allagash, Sebois, Glenwood, No. 21 Pl., Hancock County. Also permits were given in Townships 17, Range 14, and 13, Range 11, where the public lots have not been located.

For the year 1919 there has been collected and turned over to the State Treasurer, the amounts below, which have accrued from stumpage permits for the winter of 1918-1919, also for camp site rentals for the year 1918-1919.

REVENUE FROM STUMPAGE PERMITS AND CAMP SITE RENTALS.

TOWNSHIP	COUNTY	AMOUNT	TOTAL
Lakeview Plantation,	Piscataquis County,	\$326.11	
Oxbow Plantation,	Aroostook County,	5.00	
Nashville Plantation,	" "	1,756.89	
Hamlin Plantation,	" "	25.35	
Flagstaff Plantation,	Somerset County,	1,334.52	
The Forks Plantation,	" "	6,140.28	
Caratunk Plantation,	" "	2,765.94	
Long Pond Plantation,	" "	462.24	
Moose River Plantation,	" "	193.65	
Lang Plantation,	Franklin County,	3,304.00	
Coplin Plantation,	" "	4,019.34	
Dallas Plantation,	" "	857.64	
Letter E Plantation,	" "	50.25	
No. 21 Plantation,	Hancock County,	1,221.94	
No. 33 Plantation,	" "	283.00	
Township 10, Range 4,	Aroostook County,	15.00	
" 16, " 10,	" "	1,471.17	
" 16, " 11,	" "	107.74	
" 17, " 11,	" "	232.04	
" 5, " 8,	Penobscot County,	10.00	
" 4, " 3, W. B. K. P.,	Oxford County,	24.25	
" 4, " 2, " " " "	" "	56.75	
" 5, " 3, " " " "	" "	49.25	
" 5, " 4, " " " "	" "	124.25	
" 5, " 5, " " " "	" "	50.00	
" 3, " 4, " " " "	Franklin County,	90.00	
" 3, " 3, " " " "	" "	100.00	
			\$25,076.60
Passamaquoddy Indian Fund, Indian Twp.,		1,988.46	
Fort Kent (Sale of Land)		71.10	
Madawaska (Sale of Land),		99.93	
Islands (Lease),		135.00	
Interests (On Deposits),		231.48	
Office Fees,		77.50	
			2,603.47
	Total		\$27,680.07



## Laws Relating to Public Lands.

*The Public Lands. Land Agent. Location and Care of Lots for Public Uses.*

Sections 1-14 The Land Agent, his Appointment, Powers and Duties.

Sections 15-27 Lands Reserved for Public Uses.

### THE LAND AGENT

*Sec. 1. Appointment of Land Agent; bond; duties and restrictions of Land Agent. R. S. c. 7, § 1.* The governor with the advice and consent of council shall appoint a land agent, who shall be a trained forester or a person of skill and experience in the care and preservation of forest lands and shall hold his office for a term of four years and shall give bond to the State in the sum of fifty thousand dollars with sufficient sureties or with one or more surety companies authorized to do business in the State, as surety or sureties, satisfactory to the governor and council for the faithful performance of the duties of his office. The land agent shall superintend and manage the sale and settlement of the public lands. He shall not when appointed, or while in office, be directly or indirectly concerned in the lumber business on the State lands, or in the purchase thereof, or of any timber or grass growing or cut thereon. The first appointment under the foregoing provision shall be made January first in the year of our Lord one thousand nine hundred and twenty.— (Approved March 17.)

*Sec. 2. To receive moneys arising from land and attend personally to the duties of his office; no commission allowed; traveling expenses to be paid; number of his clerks and their pay. R. S. c. 7 § 2.* He shall receive all moneys and securities accruing to the State from the sale of lands, timber and grass, or in payment for timber or grass cut by trespassers, and shall pay to the treasurer of State all moneys so received and found due from him on settlement. All securities shall be made payable to said treasurer. He shall personally attend to the duties of his office, so far as practicable; no commission shall be allowed him for his disbursements or collections, and nothing shall be allowed him for traveling expenses from his home to the land office, unless on official business, nor for transportation of the official records, unless money is paid out specifically therefor. All persons employed by him shall be sworn to the faithful discharge of their duties, and they shall not be concerned directly or indirectly, in the purchase of lands, or of timber or grass on lands belonging to the State. The number of his clerks shall be determined by the governor and council, who shall fix their compensation.

*Sec. 3. Land agent to execute deeds, collect notes, and account monthly to treasurer of State. R. S. c. 7 § 3.* He shall execute deeds in behalf of the State, conveying lands which have been granted by the legislature or sold by lawful authority, as soon as the grantees have complied with the conditions of their respective grants; collect all sums due the State by note or from any source mentioned in this chapter; collect the interest on all notes at least annually, and pay at the expiration of every month into the State treasury all moneys so collected or received by him, after deducting all such payments as devolve upon him to make.

69 Me. 78.

*Sec. 4. Certified copies of records of deeds in land office recorded in registry of deeds, legal evidence. R. S. c. 7, § 4.* A copy from the records in the

land office of a deed from the State of the land of the State, or of a deed from the State and from the commonwealth of Massachusetts of the undivided lands of the State and of said commonwealth, or a deed from said commonwealth of the lands of said commonwealth of Maine, certified by the land agent or other legal custodian of such records as a true copy thereof, may be filed and recorded in the registry of deeds in the county or registry district where the land lies, with the same effect as if the deed itself had been recorded, whether said deed shall or not have been acknowledged by the agent or other person making the same; and such record shall have all the force and effect of a record of deeds duly acknowledged, and certified copies thereof from such registry shall be evidenced when the original would be.

77 Me. 76.

NOTE. Tax deeds from treasurer of State, and releases and certificates to be recorded in land office, c. 10 § 46.

*Sec. 5. Board for surveys of lands; plans and field notes to be kept at land office. R. S. c. 7, § 5.* The governor and council and land agent constitute a board under whose direction all surveys of land shall be made. An accurate plan or map of all lands surveyed shall be returned to the land office and entered upon the plan-books within three months after the survey is completed, on which shall be laid down all lakes, ponds, rivers, streams, falls, mill sites and roads. The field notes of such surveys shall be deposited in the land office within three months and shall contain a description of the growth, soil and general character of the township, and of every lot, if surveyed into lots. Said plans and field notes shall be kept at the office in Augusta, open for inspection at all times when the land agent or his assistant is there; he shall aid in furnishing information about the public lands to all who seek for it at his office.

*Sec. 6. Land agent authorized to sell lands, and rights to cut timber belonging to the State. R. S. c. 7, § 6. 1915, c. 306, § 1.* The land agent, under direction of the governor and council, shall sell at public or private sale and grant rights to cut timber and grass belonging to the State and may lease camp sites on land belonging to the State, on such terms as they direct; also the right to cut timber and grass and lease camp sites on lots reserved for public uses in any township or tract of land until the same is incorporated. Preference in such sales or leases shall be given to citizens of the State of Maine.

NOTE. License required for maintaining sporting camp within Maine forestry district, c. 33, § 15.

*Sec. 7. Agent may grant permits; bond; timber held for payment. R. S. c. 7, §§ 40, 41, 42.* The land agent may grant permits to individuals, to cut and haul timber of all kinds upon lands owned by the State, on such terms and conditions as he thinks proper. Persons obtaining such permits shall give bond to the land agent with satisfactory sureties for payment of stumpage and the performance of all conditions of the permit. All timber cut under permits is the property of the State until the stumpage is paid in full.

47 Me. 23.

*Sec. 8. Surveyors, their appointment, oath and duty. R. S. c. 7, § 44.* Surveyors or scalers shall be appointed by the land agent, and sworn; they shall scale all timber cut under permits, superintend the cutting thereof, and make return to the land agent of the number and quality of the logs cut,

whether hauled or not, and the number of feet board measure, and shall see that the timber is cut clean and without strip or waste.

*Sec. 9. Land agent's report. R. S. c. 7, § 50. 1915, c. 306, § 3.* The land agent shall on the first secular day of December biennially report to the governor a particular account of all the doings of his office for the two preceding years; the State auditor shall audit and settle his accounts at the close of each year, and at such other times as the governor and council may designate.

*Sec. 10. All deeds made absolute; State lands to be sold at option of land agent in No. 4, R. 4, W. E. L. S., and in No. 14, R. 4, W. E. L. S., R. S. c. 7 § 35.* All deeds given by the land agent, providing in substance, "that if the grantee has failed to perform all the duties required of a settler, in conformity to chapter five of the revised statutes, approved April seventeen, eighteen hundred and fifty-seven, and all other acts additional or amendatory thereto, the deed shall be void," convey as absolute and complete a title as if such condition or reservation was not contained in said deed. Lots or sections of land in township number four, range four, W. E. L. S., and lots of land in township number fourteen, range four, W. E. L. S., exceeding the quantity allowed to be sold to settlers, may be sold if, in the judgment of the land agent, such lots or sections are not valuable for lumber growth, but are found to be better adapted for settlement than for other purposes.

*Sec. 11. Settler's lot to the value of \$1,000, exempt from attachment. R. S. c. 7, § 38.* Whoever purchases a lot of wild land of the State for settlement, and complies with the condition of purchase, may hold it with the improvements thereon, free from attachment and levy on execution, while he remains in actual possession thereof. The value so exempted, shall not exceed one thousand dollars, to be set off to the owner in such portions of the lot as he directs, by the appraisers appointed to levy an execution, as real estate is set off and appraised on execution.

*Sec. 12. Descends to children free from debts of deceased, until youngest is 18 years old. R. S. c. 7, § 39.* On the death of such purchaser, such lot and the improvements shall descend to his children, subject to the right and interest of his widow by descent, and are not liable for payment of his debts, unless his other property is insufficient therefor; and, in that case, his children shall have the occupancy and improvement thereof, subject to the right and interest of the widow by descent, until the youngest surviving child attains the age of eighteen years. The remainder, after the estate of the widow, and after the youngest surviving child attains said age, may be sold as other estates of deceased persons for payment of such debts, if the other estate of the deceased is not sufficient. If he dies without issue, such lot shall descend and be disposed of like other property.

*Sec. 13. Trespasses, prosecutions for them; measure of damages. R. S. c. 7, § 9.* If any person unlawfully enters and trespasses upon the public lands, or upon any lands reserved for public uses, while under care of the agent, and cuts, takes or carries away, any trees or grass upon said lands, he and all persons who furnish teams, implements, apparatus or supplies of provisions, or of other articles, used in committing and carrying on such trespasses, are trespassers, jointly and severally liable in damages for such trespasses, and they may be sued therefor in any county. The measure of damages is the highest price which such timber, logs or other lumber, or hay, would bring at the usual place of sale thereof. Nothing in this section affects



SCENE ON GOLD BROOK.

Gold in very small quantities is found here.

the right of the State to seize and sell any timber, logs, lumber or hay, cut as aforesaid. At such sale no person, who was in any way concerned in committing such trespass, or in supplying or aiding those who committed it, shall become a purchaser directly or indirectly.

45 Me. 69; 49 Me. 390; 78 Me. 264.

*Sec. 14. Damages, if suit is for benefit of an individual. R. S. c. 7, § 10.* When an action for such trespass is prosecuted in the name of the State for the benefit of an individual, the principles of decision and the measure of damages shall be the same as in like actions between individuals.

See c. 100, § 9.

#### LANDS RESERVED FOR PUBLIC USES

*Sec. 15. Reservation for public uses; may be located by agreement. R. S. c. 7, § 11.* In every township there shall be reserved, as the legislature may direct, one thousand acres of land, and at the same rate in all tracts less than a township, for the exclusive benefit of such town or tract, to average in quality, situation and value as to timber, with the other lands therein. In townships or tracts sold and not incorporated, the lands reserved for public uses may be selected and located by the land agent and the proprietors, by a written agreement, describing the reserved lands by metes and bounds, signed by said parties, and recorded in the land office. The plan or outline of the land so selected shall be entered on the plan of the township or tract in the land office, which shall be a sufficient location thereof.

See Articles of separation, condition 7. See c. 17, § § 61-63; 26 Me. 205; 30 Me. 377; 97 Me. 336; 112 Me. 424.

*Sec. 16. Location without agreement. R. S. c. 7, § 12.* When the land agent and proprietors of such township or tract cannot agree on such location, if the right to cut the timber and grass thereon until the town is incorporated or organized as a plantation has not been sold, the land agent may petition the supreme judicial court for the appointment of commissioners to make the location as hereinafter provided. The petition may be filed, and the proceedings under it had in any county.

97 Me. 336.

*Sec. 17. Land agent to have care of lots located; may sell timber and grass. R. S. c. 7, § 14.* The land agent shall have the care of reserved lands in all townships or tracts, until they are incorporated, and the fee becomes vested in the town. He may, from time to time, sell for cash for such sum as he thinks just and reasonable, the timber and grass thereon, or the right to cut the same, until incorporated into a town, except the grass growing on improvements made by an actual settler. When so sold, he shall give the purchaser a permit under his hand and seal, setting forth the terms of the contract, which permit shall be recorded in the office.

Sec. c. 17 § § 50-60; 30 Me. 381; 45 Me. 69; 49 Me. 390; 61 Me. 446; 78 Me. 264; 97 Me. 336.

*Sec. 18. Land agent to keep an account with lots. R. S. c. 7, § 15.* The land agent shall keep an account with each such township and tract, in which shall be entered all expenditures made on account thereof, and all sums received therefrom. He shall settle his account of such receipts and expenditures annually with the State auditor and pay to the treasurer of State the



PASTURE PINE.

Photo by Maine Forestry Dept.



PASTURE PINE.

Photo by Maine Forestry Dept.

Showing how such growth is often treated. By lopping off the lower limbs a better appearance is made; but it is believed that a better growth results from natural pruning.



balance in his hands, specifying each township and tract from which it was received.

61 Me. 447, 448; 97 Me. 336.

*Sec. 19. Treasurer also to keep account. R. S. c. 7, § 16.* The treasurer shall keep a separate account with the reserved land in each township, in which account he shall enter all sums by him received and paid on account thereof; and the balance shall remain in the treasury until such township or tract is by law authorized to receive it; and thereupon it shall be paid to the proper officers thereof.

61 Me. 447, 448; 97 Me. 336.

*Sec. 20. Money to constitute school fund. R. S. c. 7, § 17.* The money arising from the sale of timber and grass or from trespasses on reserved lands, paid into the treasury of the county in which the township is situated, or into the State treasury, constitutes funds for school purposes, of which the income only shall be expended and applied as is by law provided.

61 Me. 447, 448; 97 Me. 336.

*Sec. 21. Management of fund. R. S. c. 7, § 18. 1915, c. 114.* The interest shall be added to the principal of such fund, until the inhabitants of such township or tract are incorporated into a town or organized as a plantation, and establish in such plantation one or more schools, and until the first day of January next preceding the date upon which the treasurer of said plantation shall call for such interest, unless previously expended according to law. When any such township is incorporated as a town, said funds belonging to it shall be paid by the treasurer of State to the treasurer of the trustees of the ministerial and school funds therein, to be added to the funds of that corporation, and held and managed as other school funds of that town are required to be held and managed. If such township or tract is organized as a plantation, the interest of said fund shall be paid annually by the treasurer of State to the treasurer of such plantation to be applied toward the support of schools according to the number of scholars in each school. Said interest shall be cast up to the first day of each January, by the treasurer of State. The State superintendent of public schools shall file a list of such plantations with the amount due for interest for the preceding year according to a record of such amounts to be furnished to him by the treasurer of State, in the office of the State auditor, who shall thereupon insert the name and amount due such plantations in the first warrant drawn in that year. The State superintendent of public schools shall be satisfied that all such plantations are organized, and that schools have been established therein according to law, that assessors are sworn and qualified, and that the treasurers of such plantations have given bonds as required by law.

61 Me. 447; 97 Me. 336.

*Sec. 22. When school lands revert to State, land agent shall exercise control of lands and funds. R. S. c. 7, § 19.* When the incorporation of a town is repealed, the care and custody of the school lands therein reverts to the land agent and he has the same powers in relation thereto which he would have if such town had never been incorporated; and the school funds of such town shall be collected and transmitted to the treasurer of State and by him made a part of the permanent school fund belonging to such township or

tract. The land agent is charged with the duty of enforcing the provisions of this section and is authorized to commence and maintain suits in the name of the State for this purpose.

*Sec. 23. Location of land where portions are reserved on grant, how made. R. S. c. 7, § 20.* When in the grant of townships or parts thereof, certain portions of them are reserved for such townships, or for public uses, and they have not been lawfully located in severalty by the grantee for the purposes expressed in the grant, the supreme judicial court in the county where the land lies, on application of the land agent, may appoint three disinterested persons, and issue to them a warrant, under the seal of the court, requiring them, as soon as may be, to locate in separate lots, the portions reserved for such purposes, and to designate the use for which each lot is so reserved and located, such lots to be of average quality with the residue of lands therein.

Sec. c. 93, § 29; 17 Me. 426; 26 Me. 205; 29 Me. 42; 30 Me. 219; 33 Me. 304; 104 Me. 551; 112 Me. 423.

*Sec. 24. Proceedings by committee; record. R. S. c. 7, § § 21, 22, 23.* Said committee, before acting, shall be sworn before a justice of the peace; and a certificate thereof shall be indorsed on the warrant. They shall give notice of their appointment, and of the time and place of their meeting to execute it, by publishing it in some newspaper in the State to be designated by the court, and by posting written notifications in two or more public places in the same plantation or town, if so ordered by the court, at least thirty days next prior to their meeting. They shall make return of said warrant and their doings thereon, under their hands, to the next supreme judicial court in the county after having completed the service; which, being accepted by the court, and recorded in the registry of deeds in the county or registry district where the land is situated within six months, shall be a legal assignment and location of such reserved portions for the uses designated.

8 Me. 135; 26 Me. 205.

*Sec. 25. Location by grantee, how made. R. S. c. 7, § 24.* When the grantee of any such lands severs and locates such reserved portions thereof for the purposes mentioned in the grant, designating the use for which each lot is located, and presents it to said court, the court may confirm it and such location shall then be legal and conclusive, being recorded as before mentioned.

*Sec. 26. Location on partition. R. S. c. 7, § 25.* Such severance and location may also be made and completed in the manner prescribed in section twenty-nine of chapter ninety-three.

*Sec. 27. Exceptions may be filed. R. S. c. 7, § 26.* Any person aggrieved by the opinion, direction or judgment of said court in matter of law, in a proceeding for the location of such public lots, may allege exceptions thereto as in other actions.

NOTE. Review of proceedings for location of lands reserved for public uses, c. 94, § 1.

In cases of inquests of office, plan to be filed in land office, c. 98, § 8.

Duties of land agent as to timber and grass on reserved lands forfeited for taxes, c. 10, § § 55-6.



THE PITTSTON ROAD IN THE MOOSEHEAD  
LAKE REGION.

You will hardly recognize this as a tote road. Instead of the slow and laboring tote sled the toting is done mostly with auto trucks.

Photo by Milford Baker.

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# **White Pine Blister Rust**

In Co-operation with the Bureau of Plant Industry  
United States Department of Agriculture,  
Washington, D. C.

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### A STORAGE PLACE FOR TOOLS.

One of the types of store-house used by the Maine Forestry District for storing fire fighting tools in the woods.

Photo by Maine Forestry Dept.

# BLISTER RUST CONTROL

STATE OF MAINE

1919



**P**RIOR to the opening of the field season of 1919, the work done in Maine consisted of demonstration and eradication areas at Alfred, Brunswick, and Kittery Point; of general scouting for the disease throughout the state; and of inspection of plantations, particularly those planted with stock from outside of Maine.

The program for 1919 included the completion of the eradication area at Brunswick; checking over the eradication areas at Alfred and at Kittery Point; and the beginning of a project for mapping the white pine areas of the state, as a basis

for more definite information as to the exact location and extent of the white pine, and as a guide to further investigation and eradication.

From the work already done it seems evident that any program of state-wide or general eradication is altogether out of the question and impractical both from the physical and economic standpoint. Enough has been done to be thoroughly convincing on this point. It is necessary, therefore, to have definite and detailed information as to where the most valuable white pine stands are located, not only those of present, but also those of potential economic value, in order to advise the owners as to the best means of keeping the blister rust from such areas, and suppressing or at least holding it within bounds if it is found.



No such information is at present available, and it is considered essential as a basis for the future state policy in regard to blister rust control, inasmuch as the experimental work so far carried on by the State and the Federal government has obtained most of the important data necessary for the information of private owners who are willing to aid in combating the disease.

It is becoming increasingly evident that from now on the owner of white pine owes it to himself as well as to his neighbor to protect his pine from blister rust, just as he protects any timberland from fire. A certain expenditure will be necessary to effect this, just as he must pay insurance in one form or another for the fire protection of his timber crops.

The best methods of procedure and accurate cost figures for eradication work in some eight or ten different types of land have been carefully worked out in the scientific, experimental and demonstration work done to date by the State and Federal organization coöperating, and it is hoped that this work may be continued for any data needed; but it is to the private owner that we must look in the future for taking the initiative in the actual eradication work.

Both the State and Federal organizations stand ready to advise, to coöperate and to coördinate the work undertaken by towns and cities, as well as by corporate and private owners to protect their lands. Further than this they should not be expected to go in the matter of eradication.

In order to aid in eradication of ribes from white pine areas the offer is made to duplicate the amount of any funds appropriated by towns, or organizations of any kind, or contributed by individual citizens for the protection of their timberlands, and the Forestry Department of the State stands ready at any time to plan coöperative work with any organization or individual wishing to do eradication work.

To facilitate such coöperation the use of the following form of agreement is suggested:

#### STATE OF MAINE

##### Forestry Department.

##### *Coöperative Agreement—Control of White Pine Blister Rust.*

Memorandum of understanding between the Forest Commissioner, Maine Forestry Department, and \_\_\_\_\_ of \_\_\_\_\_, Maine, herein known as the Coöperator.

1. For the purpose of protecting white pine growth against the disease, commonly known as the White Pine Blister Rust, the Coöperator hereby agrees to contribute the sum of \$——, to be expended under the direction of the Commissioner.

2. The Commissioner agrees to expend the sum contributed by the Cooperator in the control of the White Pine Blister Rust on the land of the Coöperator, particularly for the removal of currant and gooseberry bushes.

3. In consideration of an agreement between the Commissioner and the Bureau of Plant Industry, U. S. Department of Agriculture, whereby Federal aid is furnished to the State and its Coöperators, the Commissioner hereby agrees to expend an equal sum, in the control of the White Pine Blister Rust, on the land of the Coöperator, or on land adjacent or nearby, so that the Cooperator's pine growth may hereby be better protected.

4. In order to facilitate the handling of field crews and accounts, the Cooperator agrees to advance to the Commissioner, the contribution of \$——, upon the request of the Commissioner, before eradication work is begun on the Coöperator's land.

5. It is agreed that the charges against the total sum available for this project shall consist of wages and expenses of field men, and shall not include charges for clerical work nor overhead expenses incurred at the central office at Augusta.

6. It is agreed by the Commissioner that upon the completion of this work, a statement of all expenditures incurred in carrying out this project, together with a report indicating the area where control measures were performed, will be rendered to the Coöperator.

This agreement, signed this \_\_\_\_\_ day of \_\_\_\_\_ 1920, shall remain in effect until the completion of the control measures herein specified.

Countersigned:

_____	_____
<i>Agent</i>	<i>Coöperator.</i>
	Maine Forestry Department,
	By _____
	<i>Forest Commissioner.</i>

## ORGANIZATION

As formerly, the administration of the work was placed in the hands of the Forest Commissioner. Mr. Neil L. Violette of Augusta was appointed Collaborator; John M. Briscoe of Orono was appointed Agent in charge of field work; and Francis G. Marden, Clerk.

The coöperative agreement with the Bureau of Plant Industry of the United States Department of Agriculture was renewed in practically the same form as for the two preceding seasons.

The State Collaborator and Agent acted as inspectors and supervisors so that no additional men were employed for that purpose.

The foremen placed in charge of the eradication crews, of six men each, were: Mr. G. H. Kimball, of Waterboro, and Mr. P. F. McGouldrick of Augusta, both having had previous experience in the work. After the close of the eradication work, Mr. Kimball did scouting work in the southern part of York County, immediately north of the eradication area at Kittery Point, and this area is now ready for eradication work next season.

The field season began May 1st, and continued into September. Mr. Foster was retained on the mapping work into November and

Mr. Kimball on scouting up to November 1st. During the season, the following names appeared on our payroll, most of them, with the exception of G. H. Curtis and L. G. Morton, for the greater part of the field season:

MEN EMPLOYED ON BLISTER RUST CONTROL  
SEASON OF 1919

Bisson, A. L.	Skowhegan, Maine	July 8-September 1
Curtis, D. S.	Brunswick, Maine	May 19-September 1
Curtis, G. H.	Brunswick, Maine	May 19-June 7
Dow, Frank	Augusta, Maine	May 19-September 30
Davis, L. K.	Augusta, Maine	May 1-July 25
Doyon, Henry	Augusta, Maine	June 2-September 1
Foster, N. H.	Newcastle, Maine	May 1-November 15
Jones, C. K.	Augusta, Maine	May 1-June 24
Kimball, G. H.	Waterboro, Maine	May 19-October 31
Lambert, A. J.	Augusta, Maine	May 19-September 1
Marden, F. G.	Orono, Maine	May 19-September 1
Morton, L. G.	Augusta, Maine	May 1-June 3
McGouldrick, P. F.	Augusta, Maine	May 1-September 1
Philbrick, Wm.	Skowhegan, Maine	July 8-September 1
Pepin, L. S.	Augusta, Maine	May 19-August 15
Pierce, I. G.	Augusta, Maine	May 1-September 1
Read, C. D.	Orono, Maine	July 1-September 30
Redman, J. E.	Augusta, Maine	May 1-July 19
Taber, C. W.	Augusta, Maine	May 1-September 1
Turner, P. S.	Augusta, Maine	May 1-August 27
Willetts, H. F.	Augusta, Maine	May 19-August 26

The following instructions governing crews employed in coöperative eradication work were agreed to in writing by each employee:

The foreman will be held accountable for the efficient supervision of the crew, and crew members shall be under his personal direction while employed. In unsettled or doubtful weather, the crew shall begin work at the usual hour and shall not stop eradication work until the weather prevents further work. In rainy weather, at the discretion of the foreman, crew members shall report at crew headquarters or such other point as the foreman may designate. In fair weather crew members actually engaged in eradication work shall be paid the regular hourly rate agreed upon, but for rainy weather, when not engaged in eradication work but subject to the direction of the foreman, they shall be paid one-half of the regular hourly rate. It is understood, however, that for all time for which pay is allowed crew members shall be under the immediate direction of a foreman. Provided that if time lost

from Ribes eradication on account of bad weather does not exceed more than one hour in any one day, payment for this hour will be made at the regular hourly rate for Ribes eradication. Foremen and crew members being paid on an hourly basis are not entitled to annual or sick leave and will not be paid for holidays unless work is performed on such day.

2. Transportation may be provided to and from work, when place of employment exceeds two miles from headquarters, if the supervisor thinks this advisable and first gives his approval.

3. It is expected that all field men will conduct themselves during working hours, and at all other times, in such manner that there will be no room for criticism by the public. The foreman is empowered to dismiss any member of his crew whose conduct may be detrimental to the work.

4. It should be clearly understood by all crew members that the foreman has authority to discharge any man employed under him for inefficient work or for failure to respect these instructions.



WASTE IN LUMBERING—THE BIG TOP.

Here a splendid spruce was topped off at thirteen inches, leaving twelve lineal feet of merchantable timber in the woods.

Photo by Maine Forestry Dept.

In any case where a crew member, or other person working under the direction of the foreman, is so discharged, and considers such action by the foreman unjust, the matter may be referred by the discharged employee to the supervisor for final settlement.

5. Where any tools or instruments are issued to field men, they will be required to sign a receipt for same, and will be held responsible for the return of such tools in good condition, reasonable wear and tear excepted. In case tools or instruments are lost or damaged through carelessness, the person so responsible will be charged the actual cost.

All coöperative employees (whether under Federal appointment or not) shall carry with them at all times a card issued by the State



WASTE IN LUMBERING.

Logs left to rot on the yard.

Photo by Maine Forestry Dep..

Coöperator authorizing them to enter on private property in performance of duty, and destroy such pines and Ribes as may be directed by the State Coöperator. No employee shall represent himself as destroying pines or Ribes under Federal authority since under the Constitution of the United States, this is a power which can be exercised only by the State.

When employed on any public or private property, no field man shall remove or destroy any cultivated Ribes until someone in authority has explained the nature of the disease, and has obtained



permission from the owner to remove them, unless a properly authorized State official shall give orders for the removal of such bushes. The foreman or other person in charge shall report the name of the owner, the number and condition of cultivated Ribes removed, and the number left.

Great care must be taken by field men to be sure to get all of the main roots of each currant or gooseberry bush pulled. As an aid, tools will be provided, but they are intended to assist in loosening the roots, and should not be used to cut them off.

All Ribes on any control area, where eradication work is carried on, must be removed except as ordered by the supervisor. When a road is a boundary of a control area, the Ribes are to be removed



WASTE IN LUMBERING.

A tier of logs that has lain in the woods twenty-six years. It is interesting to compare the size of these logs with the average size of present day logs. As near as can be estimated this tier averaged about three logs to the thousand feet. One spruce in fair state of preservation measured seventeen inches at the top end and forty-one feet in length. This gives a contents scale of about six hundred feet, board measure. Photo by Maine Forestry Dept.

on both sides of the highway, including both sides of the fence lines bordering the highway.

6. The foreman of each crew will be required to fill out completely (or as designated) the B. R. Form No. 1, and shall mail the same at the end of each working day to the central office in Boston, and to such other place or places as designated by the State Agent



in charge. Failure to mail these forms daily as designated may be considered sufficient cause for the dismissal of the foreman responsible.

The foreman, on leaving field headquarters in the morning shall leave a note, telling of the plan of work for that day, and indicate on a map the location of his crew. This will enable the supervisor or others to easily locate the field force.

7. The foreman of all crews should bear in mind that they are responsible to the supervisor, and are expected to coöperate at all times with him to the best of their ability.

The supervisor shall have complete charge of all crews assigned to him, and shall be responsible to the State Agent in charge of Blister Rust Control Work.

8. Where resignations or dismissals from the service have reduced the personnel of the crews, the supervisor is empowered to hire locally the necessary men.

9. The supervisor shall be responsible for the correctness of the B. R. Records of each foreman, and in event of any error on these reports, shall notify the State and central office at once, by mail.

10. In case any foreman under the supervisor shall prove inefficient, or in any manner negligent in his duty, the supervisor is empowered to discharge him from the service. Where any disagreements arise between a foreman and supervisor, the matter shall be referred to State Agent in charge.

11. All supervisors, foreman and crew members are expected to coöperate to the best of their ability, and in a proper spirit with any State or Federal Inspectors, who may be sent to investigate Blister Rust Control Work. While the authority of such inspectors, unless by special written order of the person in charge, does not extend to any member of the field force, it should be distinctly understood that these men do not come to find fault, but to assist in improving our work. A friendly spirit of coöperation between all concerned will be of great benefit to the work. Suggestions will be welcomed by the inspectors, and proper credit given for such suggestions.

We were very fortunate in securing two exceptionally well prepared and capable men for the mapping work, their experience having been gained in technical schools in this country, and at the Artillery School of Fire, Southern France. Both Mr. N. H. Foster and Mr. P. S. Turner turned out fine work in connection with the



#### WASTE IN LUMBERING—THE HIGH STUMP.

This sound spruce stump was seventeen inches in diameter and by going well down to the swell of the roots could have been cut twenty-one inches lower. Approximately fifty of such stumps would yield a cord of merchantable pulpwood of the best quality.

Photo by Maine Forestry Dept.



Scene on West Branch Penobscot.

Photo by J. F. Philippi.

white pine survey in the southern part of the state, beginning in the town of Kittery, and continuing through Eliot and York, up to the Berwick line.

The labor situation was not very different from what we had to contend with during the field season of 1918, and prices were about the same.

Advertisements in local papers brought but three applicants, or even inquiries, and only one of these would consider the job at all at the wages offered. He happened to be an experienced woodsman, living at home for the summer, and he liked the kind of work offered well enough to forego larger wages in more confining employment. He proved to be one of our best and most satisfactory men in every way.

### SCOUTING

Both Mr. Curtis and Mr. Kimball, as well as the State Agent, did scouting work during the season, but no new areas of infection were discovered. This would seem to indicate that the disease is not spreading, at least to any alarming degree throughout Maine.

Whether we can go so far as to say that the work already done has had an effect in holding the disease in check and in confining it to the areas now known to be diseased, is problematical. Certainly there are no present indications of a rapid spread of the disease.

It is, therefore, against the possible damage to young growth and reproduction of this valuable species that we must direct all our efforts.

The method of preliminary scouting adopted at the request of the Bureau of Plant Industry for eradication work proved satisfactory and helped to reduce the cost figures on eradication areas where it was used.

The following method, as outlined by Mr. E. C. Filler, has been used in Maine:

### PRELIMINARY SCOUTING

Preliminary scouting is used to advantage in sections where the bushes are comparatively few, and grow more or less in patches, or in a territory where only certain types contain Ribes. Such scouting consists of finding the Ribes in a section and marking their location in the field and on a map so that the bushes in such places can be pulled at some future time without having to strip the whole area. No eradication work is performed by the crew in



# NATURAL REPRODUCTION.

Photo by Maine Forestry Dept.

This young spruce is left to grow after ten inch diameter limit cutting.



# UNDERSIZED TIMBER LEFT AFTER LIMIT CUTTING.

It may be expected that another cut of merchantable timber can be made here in a few years if fire is kept out of the slash.

Photo by Maine Forestry Dept.

those areas that are shown by the scout as containing no Ribes. This scouting system is a prime factor in reducing the cost of eradication.

The success of this method will invariably depend upon the ability of the scout. No set rules can be applied to scouting. It is a thing that requires natural ability in handling one's self in the woods. A scout must have good judgment, keen eyesight, and be most conscientious in his work. On his reports will depend what eradication work is to be done.

The following methods have proven most effective in preliminary scouting for ribes. The scout covers the section by running parallel strips with a compass every 100 or 200 feet, giving particular attention to those places where Ribes are likely to occur. If only a few bushes are found the scout pulls these. However, when scattered Ribes are found more or less abundantly, or patches of Ribes, such as skunk currants, are encountered, he does not try personally to eradicate these. In such cases, the scout marks the trees, by paint or blaze, around the patch and then arrows a line out to the nearest road or some natural feature, as a stream. Here he marks a tree by the roadside in a definite way, as a cross within a circle. In some cases, instead of marking each Ribes plot by a trail direct to the road, or some natural feature, two or more such areas may be connected by a blazed line. On an enlarged map of the section covered, the scout shows the approximate location of the areas containing Ribes, the trails to such plots from the roadways, and any connecting lines between plots.

Later the foreman of the crew, with this map in his possession, takes the men to the nearest Ribes mark shown near a road. Then following the blazed trail, he locates the patch of bushes, and directs the crew to pull them. The men move from one plot to another until all the areas containing Ribes have been covered. If some of the marked plots containing Ribes are large, it may be advisable for the crew to run strips, but usually this will not be necessary.

In order to eliminate blazing a trail from the Ribes patch to the roadway, the following system has been successfully tried out, where only a few patches of Ribes were found. The scout marked the approximate location of the currant or gooseberry plots on his map, and also made a mental picture of their exact location. When the foreman wished to have the Ribes in these plots eradicated, he asked the scout to take the crew to these places. In some cases, it may work well for the foreman and scout to alternate in their

duties. During that day, when the scout is showing the crew the Ribes plots, he could act as foreman, while the regular foreman could scout other sections.

If a scout knows a territory thoroughly, it may not be necessary for him to run parallel strips on his scout work. In such a case, he would scout effectively the places where he knows Ribes are liable to be found, and only roughly cover the other areas. For instance, in a territory where there are no skunk currants and practically no gooseberries on the dry hardwood ridges, he would confine most of his efforts in scouting the lowlands, along stream valleys, little runs, and hillside swamps. To check himself, he would occasionally run a strip along the ridge.

Where Ribes are very few and grow more or less in definite places, as in swamps, a method has been tried out, more or less successfully, where the whole crew scout in line formation with spaces of about 50 to 100 feet between the men. Here the lineman uses a compass for running his line, and does not mark it in any definite way. The men run a strip across the area to a definite boundary, and then return on the next strip, continuing in this manner until the whole section is covered. If Ribes are found, the linemen mark their lines, and the whole crew closes in and pull the bushes. As soon as these Ribes are eradicated, the line is re-established, and the crew continue on their strip.

During October Mr. Kimball scouted over 1160 acres in the town of Kittery, outside of and adjacent to the eradication area, at a cost of a little less than nine cents per acre, taking out the small groups of Ribes, and marking the larger groups for crew eradication.

### ERADICATION AREAS

The Brunswick-Bath area was the only area on which eradication work was done this year, with the exception of the checking work on areas already gone over in whole or in part at Alfred and Kittery Point.

A portion of the Brunswick area was eradicated in 1918, but the greater part was done during the present field season. A section of some 1200 acres in West Bath was selected as a demonstration eradication area. It comprised practically all types recognized in the eradication work, and has great variations in topography, ranging from sea-level swamps and salt marshes to precipitous ridges.





PINE BLISTER RUST WORK IN MAINE. Photo by J. M. Briscoe.

Crew of six men and a foreman who is really a "hindman" as he follows behind his crew and inspects the thoroughness of the work on the strip passed over.



PINE BLISTER RUST WORK IN MAINE.

Eradication work. Pulling up the plants of wild gooseberry and wild current to avoid infection of neighboring pine growth.

Photo by J. M. Briscoe.

On this area the total averages for all types are about as follows:

#### AREA—1192 ACRES

Average No. gooseberries	23.1 per acre
“ “ currants	56.8 “ “
“ “ man-hours	2.24 “ “
“ cost eradication	\$1.16 “ “

Advanced scouting was not used on this area, as the number of Ribes was heavy and the occurrence very well distributed over the entire area.

This cost includes the entire cost of maintenance for the men as well as salaries, and was the maximum for all of the work done during the season.

A larger area about Brunswick and adjacent to the demonstration area was eradicated by using the advance scouting method, and this helped considerably to reduce the cost on an acreage basis.

#### THE ALFRED AREA

On the Alfred area very careful checking was done in order to find out the actual results from the eradication work of the previous season, and to learn, if possible, what to expect in the way of organized eradication of a large area.

The results were about what might reasonably be expected. The greater part of the Ribes found this season were either young seedlings or sprouts from plants broken off in the eradication work. Of the 1528 plants found over an area of 545 acres, 1092 or 60% were sprouts or young seedlings of less than six inches, while 436 or 40% were larger plants overlooked in the eradication work of the previous season.

As a whole, however, the previous eradication showed an efficiency of 95%. Only 4.9% of the number of plants previously found were taken out during the present season's work.

A general summary of the work on all of the Alfred check plots is as follows:

#### ERADICATION: ALFRED AREA

YEAR	ACRES	NUMBER OF RIBES	AVERAGE NO. PER ACRE	% ERADICATED
1918	545	31,012	57.1	95.1
1919	545	1,528	2.8	4.9

The areas selected for the checks were taken at random from all parts of the eight and more square miles of the eradication area, the only pre-requisite being that the number of plants from the same area for the previous season should be definitely known, so that the above comparative figures might be obtained.

### THE KITTERY POINT AREA

The Kittery Point area presented more difficult problems in keeping an accurate record of the checks, inasmuch as some of the



LOW STUMP.

Photo by Maine Forestry Dept.

Five and one-half inches from the soil to the top.

data for the eradication work of previous seasons was deficient or missing. Some of the work on this area was done during the early stages of the eradication work, before the methods of procedure had been very far perfected, so that the results are not as definite or as convincing as for the Alfred area. Nevertheless, they are of value and the fact that they compare so reasonably with the work on the Alfred area would seem to indicate that they are not far out of the way.

The average number of *Ribes* found on check plots, aggregating some 425 acres on this area, was 15, up to this season's work. The finding of 243 plants, or an average of one-half plant per acre, brings the previous eradication figure to a little better than 95½%.

During the season, on all areas, more than 1000 acres were checked over, with a total average of about 41½% of Ribes of all kinds found this season, as against 95½% previously eradicated.

With improved methods and increased experience, it may be quite possible to bring this up to at least 98% or even better, and the pathologists give us every assurance that even at the present figure, the work of checking the advance of the disease will be effective.



MANUFACTURING FUEL WOOD.

The high price and scarcity of coal has acted as a stimulant to wood lot values.

Photo by C. W. Grover.

### COÖPERATION

Up to the time of this report, no coöperation with towns or private owners has been solicited in Maine, for the reason that it has been deemed advisable to await more definite results from the experimental and demonstration work being carried on by the State and the Federal Government before asking for further financial assistance from the owners who are already paying through taxation for the work now being carried on in the state.

Neither have any claims been paid for Ribes destroyed, since either the plants were diseased, and therefore they are a menace under our present law and can be destroyed without compensation

by the Forest Commissioner or his agents, or the owners have consented to aid in the work of eradication to the extent of contributing their bushes in order to check the spread of the disease. Consent of the owner (for the removal) was always secured before the eradication of any cultivated Ribes.

In all of the areas where the eradication work has been carried on, the owners have been unanimous in their preference for white pine as a crop; and in no case was the growing of Ribes of sufficient economic importance to warrant the cleaning out of the pine in the vicinity.

Several large shipments of Ribes were excluded under the quarantine act, and the present policy of the State is not to permit the entrance of any species of Ribes as long as present conditions exist.

White pine has been admitted in limited quantities from nurseries outside of the state, but only after inspection at the shipping point and also after receipt.

The following permits were issued during 1919:

#### SPECIAL PERMITS

1919

No. 1,	Mar. 12,	Keene Fy. Assoc.	to L. S. Piper, Kezar Falls,	10,000 White Pine Seedlings.
No. 2,	Apr. 23,	Amer. Fy. Assoc.	to W. A. Hodgden, East Boothbay,	10 White Pine Transplants.
No. 3,	" 23,	" " "	to H. A. Morton, South Paris,	1,310 White Pine Transplants.
No. 4,	May 3,	Keene " "	to R. A. Ring, Livermore Falls,	2,000 White Pine Transplants.
No. 5,	" 7,	Amer. " "	to Paris Mfg. Co., South Paris,	1,300 White Pine Transplants.
No. 6,	" 7,	" " "	to E. F. Crockett, South Paris,	100 White Pine Transplants.
No. 7,	" 8,	Keene " "	to P. L. Sprague, Ram Island Farm, Cape Elizabeth,	10,000 White Pine Transplants.
No. 8,	" 9,	Amer. " "	to R. L. Marsten, Skowhegan,	55 White Pine Transplants.
No. 9,	" 19,	" " "	to Freeman Marsten, Portland,	2 Limber Pines.

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No. 10,	"	23,	"	"	"	to Dr. R. L. Dennen, Mechanic Falls,
						200 White Pine Transplants.
No. 11, Sept. 23,	"	"	"	"		to Mrs. E. C. Cook, York Village,
						50 White Pine Seedlings.
No. 12, Oct. 1,	"	"	"	"		to Dayton Bickmore, Sandy Point,
						1 White Pine (5 ft.) Transplant.
No. 13,	"	21,	"	"	"	to Fletcher Steele, Biddeford,
						6 White Pine Transplants.

### ADVANCE SCOUTING

Probably the most radical change in the methods used during the present season, was in the introducing of advance scouting of the areas to be eradicated; by sending an experienced man over the area in advance of the crew and having him locate the Ribes for crew work, mark out the location, both in the field and on a map, and take out any single individual Ribes or small groups as he proceeds.

By this method considerable time is saved, particularly if the Ribes are not generally scattered over the area, but occur in more or less well defined places, varying with the topography or the ground cover.

In the actual eradication work on areas that have been previously gone over by the scout, the number of men in the eradication crew may be reduced to advantage to four men instead of six. If the location of the groups of Ribes has been well marked, both on the map and in the field, the crew immediately proceeds to the special areas and does not attempt any line formation, except possibly on the limited areas to be covered by them. Very often the Ribes will be found on either side of a small stream, brook, or creek, and two men on either side will be able to work most effectively.

Cheese-cloth bands about the trees to mark the areas where the Ribes are found have proved to be about the cheapest and most desirable form of marker from every standpoint, being easily seen, comparatively durable, and entirely non-injurious to the trees.

### NURSERIES

No infections on pine were found in any of the nurseries of the state, and no trees diseased with the blister rust were found



in plantations inspected during the present season. These included all of those planted with stock entering from without the state by special permit, and also many others planted from locally grown stock, particularly from the State Forest Nursery at Orono.

The Department of Horticulture reports finding diseased *Ribes* in practically all of the counties in the state.

The quarantine on all five leaved pines and all *Ribes* is still in force and will be continued as before.

## EDUCATION

The general public seems to be distinctly apathetic in its attitude towards the blister rust control. This may be attributed



HEMLOCK BARK AND PEELED HEMLOCK LOGS.

In the last few years the supply of hemlock bark has not equaled the demand.

Photo by Maine Forestry Dept.

chiefly to a lack of understanding of even the exact character of the disease. This we are in hopes of correcting by the circulation and general state-wide distribution of the new circular on the disease just issued through the coöperation agencies. This circular will be distributed to all woodland owners and particularly to all owners of white pine in the southern part of the state.

The Extension Service of the College of Agriculture, University of Maine, at Orono, coöperated in displaying an exhibition of the

blister rust specimens and in showing and distributing printed matter in the form of posters, circulars and post cards at the fairs and public exhibitions in the state during the last summer and fall.

Lectures on the subject were also given at the University of Maine to all Agricultural and Forestry students, and to a number of other students electing such courses, as well as conferences and correspondence with the County Agents throughout the state.

The Second Annual Report of the Plant Pest Committee was distributed, and there are still some copies of this on hand for distribution on request.

### MAPPING

After going over the matter very carefully with the representatives of the Bureau of Plant Industry, the following plan for the



SPRINGTIME.

Woodsmen will recognize this as a picture of early spring conditions in the woods. The stream is beginning to channel out; the rocks are poking up through the snow, sap is moving in the maples—it is about time to start the stream drive.

Photo by J. F. Philippi.

mapping work was agreed upon and approved by them. It was consistently followed throughout the season:

### MAPS

The United States Geological Survey Maps are used as the basis of the work. Photographic enlargements of these maps, to

the scale of 500 feet to the inch having been made, tracings are prepared from these enlargements, with proportional reductions for topographic lines, roads, and other minor features.

Black line prints from these tracings furnish the actual base maps for the field work and for the finished map of the area.

### FIELD WORK

Two men with experience in sketch and topographic mapping are assigned to this work, at the rate of \$3.50 per day for actual time worked and expenses while in the field.

One copy of each map is cut into small sections, of convenient size for sketch mapping in the field. Hand sketch boards are used for the work, and the map is first covered with a system of rectangular coördinates in light lines at intervals of one inch in each direction, showing the *magnetic* bearings. A hand compass and a six-inch rule, graduated in tenths, are the only instruments needed in the field work.

The forest type lines are drawn on these maps, checking on the magnetic lines and on the roads, streams, topography and other features shown on the base map.

Particular attention is given to locating accurately all areas of white pine according to a classification given herewith, and to making an estimate of its value.

The area of each block of white pine is obtained as accurately as is consistent with the method used, which involves pacing for the distances and checking in on roads and other features shown on the base maps.

Types other than white pine are shown as nearly as possible as they occur, without, however, pacing out distances or spending too much time in getting unessential details, such as crooks, bends and general irregularities of outline.

A list of the owners of white pine of merchantable size and of large blocks of thrifty reproduction is obtained as the mapping proceeds, and any abundant crop of Ribes, either wild or cultivated, is noted in connection with the mapping; but no extra time is devoted by the map men to getting this information. If it is deemed necessary or advisable another man will be sent over the areas mapped to get statistics and additional information in the nature of a census.

The mapping is done by townships, and one township is to be completed before starting on the next.

Detailed information as to the nature of the blister rust and the objects of the work are given to all who show interest in the work and all information on the subject, gathered from the local residents, of either pine or Ribes, will be useful.

### TYPES

Ten types are recognized and classified, five of which are subtypes of white pine, and the other five not white pine. They are identified on the map as follows, by number, letter and color:

	NAME	COLOR	SUB-TYPE	DESCRIPTION
Type I	White Pine	Green	a,—	Pure pine 12 in. or over (80% W. P.)
			b,—	Pure pine 5 in. to 12 in. (80% W. P.)
			c,—	Pure pine under 5 in. or 25 ft. high.
Type II	- - - - -			Pine and Hardwoods. Pine and other Conifers.
Type III	Hardwoods	Yellow	—over 5 in. d. and at least 67% pure.	
Type III	Hardwoods	Yellow	—over 5 in. d, and at least 67% pure	
Type IV	Brush	Brown	—	(to include thickets of briars, shrubs, small growth and cutover land, the latter to be marked with the letter sl.).
Type IVsl	Brush and Slash	Brown.		
Type IVpc	Brush and Young Pine	Brown.		
Type V	Pasture	Blue	—	(at least 65% grazing land).
Type VI	Cultivated land	White	—	all land not in other types.
Type VII	Swamps	!	—	the usual swamp designation.

The boundaries of types II and III are indicated as well as possible, but less time is taken in getting minor details of outline than in the white pine types.

Scattered pine or small blocks of pine in other types are indicated by the letter P, followed by the class symbol, and the density of the stand shown by numbers as follows:

1. Heavy                      2. Medium                      3. Light

In white pine stands anything over 2½ acres in extent is considered as a separate type, and in the other type, anything above five acres in extent, is shown as a separate type. All smaller areas are classified in the surrounding types.

## ESTIMATE

An estimate of the stand of merchantable white pine has been made for all areas shown on the map and a list of the owners is compiled for each township, showing the total acreage and an estimate of the amount of the white pine.

This estimate is obtained by taking the average of a number of one-half acre plots in each of the five sub-types of white pine. At least 25 such plots are taken as the basis for the estimate in each of the sub-types.

The areas are obtained by planimeter, and the estimate is worked up in connection with the field work.

Tabulated forms follow, showing the estimate, both in acreage and total contents for each stand of white pine, and the totals for the township.

It is intended that this shall be an estimate and not a detailed cruise of any one lot or of any particular lots of white pine, and the figures obtained shall not be applied to any one lot or stand of pine.

These maps will be of inestimable value for blister rust control and eradication work. They will give a sound and definite basis for comparing the cost of eradication and control work with the actual value of the timber saved, and they will furnish a more accurate estimate and location of the white pine than has ever been available. The results will also be extremely useful in planning all future operations for the continuance of State and Federal aid for the work.

This work was carried out and the maps made at a cost of a little more than 2c per acre.

The areas mapped for the season of 1919, blue-prints of which accompany and are a part of this report, are as follows:

TOWN	ACRES	SQUARE MILES
Eliot	550.40	.86
Kittery	10,189.60	15.77
South Berwick	4,594.20	7.18
Wells	755.20	1.18
York	36,024.40	56.21
Total	52,113.80	81.20

Of these, the only towns completed were Kittery and York.

TOWN OF KITTERY

The total area for the town of Kittery is 15.77 square miles, of which 57% is farm land and 43% forest land. White pine types represent 13% of the area, or 20% when young reproduction areas are included.

A complete summary for the town is as follows:

SPECIES	TYPE	PER CENT	ACREAGE
White Pine	Ia	1	105.38
“ “	Ib	8	789.65
“ “	Ic	4	346.76
“ “	Id	0	29.15
Hardwoods	III	2	178.81
Brush and Young Pine	IVpc	7	714.81
Brush and Slash	IVsl	19	1,935.94
Pasture	V	7	713.40
Cultivated	VI	50	5,062.66
Swamp and Waste	VII	2	313.04
Totals		100	10,189.60

TOWN OF YORK

The total area of this town is 56.21 square miles or 36,024.4 acres. The forest land includes 72% of the area, while only 28% is cultivated or in pasture. The area has been heavily cut over in the past, and 43% is at present in cut-over or slash land, only a small part of which has white pine reproduction.

A complete summary of the types is as follows:

TOWN OF YORK

White Pine	Type	Ia	1	506.72
“ “	“	Ib	9	3,292.40
“ “	“	Ic	5	1,731.09
“ “	“	Id	6	2,193.00
Hardwoods	“	III	6	2,436.39
Brush and Young White Pine	“	IVpc	5	1,749.16
Brush and Slash	“	IVsl	38	13,416.40
Pasture	“	V	6	2,374.63
Cultivated	“	VI	32	7,820.33
Swamp and Waste	“	VII	2	494.28
			110	36,024.40



EXPENDITURES

Complete reports on expenditures for the year can not be given at this time on account of necessarily incomplete data. Expenditures for the period from May 1st when the active field work was started, up to October 1st, are shown in the following tabulated statement, by projects:

EXPENDITURES

NAME OF PROJECT.	Salary		Expenses	Totals	
	Federal	State	State	Federal	State
(1) Administration and Supervision					
May.....	—	—	79.18	—	79.18
June.....	128.33	30.00	175.88	128.33	205.88
July.....	175.00	77.50	311.43	175.00	388.93
Aug.....	175.00	77.50	224.25	175.00	301.75
Sept.....	87.50	37.50	146.21	87.50	183.71
Oct.....	—	—	—	—	—
(2) Eradication					
May.....	263.85	—	95.93	263.85	95.93
June.....	1673.62	—	193.18	1673.62	193.18
July.....	—	1242.60	30.23	—	1272.83
Aug.....	1125.60	—	290.44	1125.60	290.44
Sept.....	309.60	—	47.55	309.60	47.55
(4) Investigations					
May.....	187.25	—	114.27	187.25	114.27
June.....	159.25	—	274.48	159.25	274.48
July.....	178.50	—	646.52	178.50	646.52
Aug.....	169.75	—	109.48	169.75	109.48
Sept.....	52.50	—	34.57	52.50	34.57
(6) Education.....	—	—	37.70	—	37.70
(8) Misc.....	—	—	295.10	—	295.10
	—	—	298.44	—	298.44
	—	—	114.26	—	114.26
	—	—	110.98	—	110.98
	—	—	20.89	—	20.89
Totals.....	4685.75	1465.10	3650.97	4685.75	5116.07
Grand Total. . . . 9801.82					

RECOMMENDATIONS

Since only the same appropriation as formerly, \$5,000.00, is available for the work for the season of 1920, it is recommended that the work on the pine survey be continued and that eradication work shall be undertaken only where financial coöperation with towns or owners may be obtained, to at least equal the amount so expended.

Respectfully submitted

(Signed) JOHN M. BRISCOE  
State Agent

(Nine blue-prints accompany and are a part of this report.)  
Orono, Maine.  
22 November, 1919.

## LAWS RELATING TO CONTROL OF RIBES

## CHAPTER 36.

*Resolve*, Appropriating Money for Continuance of White Pine Blister Rust Control.

*Resolved*: That the sum of five thousand dollars be, and hereby is, appropriated for the year nineteen hundred and nineteen, and the sum of five thousand dollars for the year nineteen hundred and twenty, for the purpose of controlling and eradicating the white pine blister rust in the State of Maine, as authorized by Senate bill number one hundred and seventy-one as passed by the seventy-eighth Legislature, nineteen hundred and seventeen, entitled "An Act Providing for the Control of the White Pine Blister Rust and Other Fungous and Insect Pests."—(Approved March 12.)

## CHAPTER 178, PUBLIC LAWS 1917.

An Act Providing for the Control of the White Pine Blister Rust and Other Fungous and Insect Pests.

Be it enacted by the People of the State of Maine, as follows:

Section 1. That the fungous disease commonly known as the white pine blister rust is hereby declared to be a dangerous pest in all its stages; and it is the duty of the officials hereinafter named, to prosecute the measures hereinafter specified for the control of this pest.

Section 2. The forest commissioner is hereby authorized and empowered to promulgate by letter, publication, poster or other means, information concerning the white pine blister rust and to designate by the aforesaid means of promulgation, areas within the State in which control measures are necessary or advisable. It shall be the duty of every land owner within such designated area, to carry out such control measures as are ordered by the forest commissioner, including the removal and destruction of any or all plants of genus ribes, commonly known as currants and gooseberries, and any white pine tree or trees, which are found to be infected with the disease. If the owner fails to destroy the above named plants or trees within the time specified by the forest commissioner, the forest commissioner shall cause said plants or trees to be destroyed and shall charge the actual expense of same to the city, town or plantation within which said plants are found. Such amount shall be collected as a State tax and credited to the appropriation for said purpose. The city, town or plantation wherein such plants or trees are found may assess the cost of the removal of said plants or trees to the owner of the real estate wherein the said plants or trees are found. The amount so assessed shall be collected in the form of a tax.

Section 3. The forest commissioner or his authorized agents shall have the right to enter upon any private or public lands to determine the presence or absence of the white pine blister rust in any of its stages, and to carry out the necessary eradication measures. The above mentioned commissioner may coöperate with departments of the federal government, the State department of agriculture and the agricultural experiment station for the control

or eradication of said disease in the State, and for the carrying out of such investigations as are deemed advisable by the commissioner.

Section 4. Any white pine trees or currant or gooseberry bushes which are found to be infected with *cronartium ribicola* are hereby declared to be a public menace and any such diseased trees or plants and any and all wild plants of the genus *ribes*, may be destroyed by order of the commissioner or his authorized agents. If within any designated area, as specified in section two of this act, currant or gooseberry bushes or white pine trees which are not infected with *cronartium ribicola* are designated by the commissioner or his agents for destruction, and destroyed by their specific order, the owner may be compensated therefor; the damages to be assessed by the commissioner or his agents at not to exceed the actual value of the material destroyed, and paid to said owner by the State treasurer upon authorization of the commissioner. In lieu of money damages for any trees or bushes destroyed under this act, the commissioner may offer and the owner may accept forest planting stock to be furnished from the State forest nursery, and to be paid for at cost by the commissioner.

Section 5. The State nursery inspector, under direction of the commissioner of agriculture, is hereby authorized and empowered to enter upon any land contiguous to or within the vicinity of any nursery within the State, for the purpose of determining the presence or absence of *cronartium ribicola* in any of its stages or other threatening fungous disease or insect pest, and within such area, he shall have the same power and duties for control and eradication of the white pine blister rust or its hosts as is vested in the forest commissioner or his agents, and shall have the power to enforce and carry out necessary measures for the control or eradication of other threatening fungous diseases or insect pests.

Section 6. The forest commissioner is hereby authorized and empowered to prohibit and prevent or to regulate the entry into the State of Maine or movement within the State from any part thereof to any other part, of any living five-leaved pine trees or any plants of the genus *ribes*, or other nursery stock or plants, which in his judgment may cause the introduction or spread of a dangerous plant disease or insect pest. The said official is hereby authorized to issue such orders, notifications and permits as may be necessary to carry out the provisions of this section, and any person violating any of the provisions of sections five and six shall be subject to a fine of not more than twenty dollars for each and every offence. The expenses necessary for carrying out section five of this act shall be paid from the appropriation for nursery inspection or other fund of the department of agriculture.

Section 7. The sum of five thousand dollars is hereby appropriated to carry into effect sections two, three, four and six of this act for the year ending December thirty-first, nineteen hundred seventeen, and five thousand dollars for the year ending December thirty-first, nineteen hundred eighteen.

Section 8. If any balance remains in the hands of the forest commissioner from the funds appropriated under section seven of this act which are not necessary for carrying out the purposes of this act, such balance shall revert to the State contingent fund.

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## **State Laws.**

**Forest Laws Applicable to the Entire State of Maine.**

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Dynamiting a Jam on Pulpwood Drive.

Photo by E. B. Draper.

# STATE AT LARGE

## FOREST LAWS APPLICABLE TO THE STATE AT LARGE

### CHAPTER 8. Revised Statutes.

Section 28. The land agent shall be forest commissioner of the State. He shall make a collection and classification of statistics relating to the forests and connected interest of the State, and institute an inquiry into the extent to which the forests of the State are being destroyed by fires and by wasteful cutting, and ascertain so far as he can as to the diminution of the wooded surface of the land upon the watersheds of the lakes, rivers and water powers of the State and the effect of such diminution upon the water powers and on the natural conditions of the climate. The information so gathered by him, together with his suggestions relative thereto shall be included in the report to be made by him biennially to the governor on or before the first day of December. The chief clerk to the land agent shall be deputy forest commissioner. He shall hold office during the pleasure of the forest commissioner and perform such duties as the latter may prescribe.

Section 34. Fish and game wardens are hereby made State fire wardens; they shall, while in and about the woods, caution all sportsmen of the danger from fires in the woods, and extinguish all fires left burning by any one, if within their power; and shall give notice to any and all parties interested when possible, of fires raging and beyond their control, to the end that the same may be controlled and extinguished.

Section 35. Whoever by himself, or by his servant, agent or guide, or as the servant, agent or guide of any other person, shall build a camp, cooking or other fire, or use an abandoned camp, cooking or other fire in or adjacent to any woods in this State shall, before leaving such fire, totally extinguish the same, and upon failure to do so, such person shall be punished by a fine of fifty dollars, provided that such fires built upon the sea beach in such situation that they cannot spread into forest land, woodland, or cultivated lands or meadows, shall not be construed as prohibited by this section. One-half of any fine imposed and collected under this section shall be paid to the complainant.

Section 37. All persons engaged in hunting game on any of the woodlands within any town or unincorporated place in this State, shall use non-combustible wads in the loading of firearms used by them.

Section 38. Whenever, during an open season for the hunting of any kind of game or game birds in this State, it shall appear to the governor that, by reason of drought, the possession of firearms in the forest is liable to cause forest fires, he may, by proclamation, suspend the open season and make it a close season for such time as he may designate.

Section 39. During the time which shall by such proclamation be made a close season, all provisions of law covering and relating to the close season shall be in force, and a person violating a provision of the same shall be subject to the penalty therein prescribed. Whoever enters upon the wild lands



of the State, carrying or having in his possession any firearms, or shoots during the close season fixed by proclamation of the governor, as provided in the preceding section, any wild animal or bird for the hunting of which there is no close season otherwise provided by law, shall be punished by a fine of one hundred dollars and costs.

Section 40. Such proclamation shall be published in such newspapers of the State and posted in such places and in such manner as the governor may order in writing. A copy of such proclamation and order, shall be filed with the secretary of state. A like attested copy shall be furnished to the forest commissioner, who shall attend to the posting and publication of the proclamation. All expense thereof and all the expense of enforcing the provisions of the proclamation shall be paid by said commissioner, after allowance by the state auditor, from any funds in the State treasury not otherwise appropriated.

Section 41. If after the issuing of the proclamation as provided in section thirty-eight, by reason of rains or otherwise, the governor is satisfied that the occasion has passed for the issuance of the proclamation, he may annul it by another proclamation issued as provided for the issuance of the first proclamation.

#### RAILROAD PATROL

##### Revised Statutes, Chapter 8.

Section 44. Whenever in the judgment of the Forest Commissioner, the woodlands along the railroads traversing the forest lands of the State, are in a dry and dangerous condition, he shall maintain a competent and efficient fire patrol along the right of way or lands of such railroads.

Section 45. All fires started upon the right of way of any railroad or lands adjacent thereto shall be immediately reported to the commissioner upon blanks to be furnished by him, by the patrolman within whose limits the fire originated, setting forth the origin of such fire, the quantity and quality of the land burned over, and, if the fire was started by a locomotive, he shall give the number thereof.

Section 46. The forest commissioner shall keep or cause to be kept, an account of the cost of maintaining such fire patrol along the line of such railroad, including therein the wages and expenses of the employees engaged in maintaining such fire patrol, and the total cost thereof shall be paid to the forest commissioner, by the railroad company along whose land or right of way such patrol is maintained, such payment to be made monthly or on the presentation of the bills therefor. All such funds received by said commissioner shall be credited to the fund for the protection of the forests against fire from which it was drawn.

Section 47. Nothing in the three preceding sections shall be construed as releasing any railroad company from any damage caused by fires set by their locomotives or employees.

#### RAILROAD FIRES

##### Revised Statutes, Chapter 8.

Section 48. Every railroad company whose road passes through waste or forest lands shall during each year cut and burn off or remove from its

right of way all grass, brush or other inflammable material, but under proper care and at times when fires are not liable to spread beyond control.

Section 49. All locomotives which shall be run through forest lands, shall be provided with approved and efficient arrangements for preventing the escape of fire and sparks. The forest commissioner may petition the public utilities commission, setting forth that there is danger of fire to lands within the Maine Forestry District from the operation of locomotives on said railroad; and said commission may, after notice and hearing thereon, make such orders and regulations relating to the equipment and operation of locomotives during times of drought or danger of forest fires, as they deem necessary for the prevention of fires on said lands.

Section 50. No railroad company shall permit its employees to deposit fire, live coals or ashes, upon its track in the immediate vicinity of woodlands or lands liable to be overrun by fires, and any railroad company operating a railroad through the Maine Forestry District shall between the first day of May and the tenth day of November following in each year, fasten down or secure screens or other obstructions in the windows of all cars or apartments of cars in which smoking is allowed, to prevent the throwing of burning matches, burning cigars, burning cigarettes or parts thereof from the windows of such cars, and when engineers, conductors or trainmen discover that fences along the right of way or woodlands adjacent to the railroads, are burning or in danger from fire, they shall report the same at their next stopping place which shall be a telegraph office.

Section 51. For all damages caused to forest growth by any person employed in the construction of any railroad built in this State after the third day of May, eighteen hundred and ninety-one, the company owning such road shall be primarily liable to the person or persons so damaged. During the construction of such roads through woodland, there shall be kept posted in conspicuous places on each line of the roadways at distances of two hundred feet, abstracts of the laws relating to forest fires. Any person employed in the construction of such railroads, who shall set or cause to be set, any fire along the line of said roads, shall, before leaving the same, totally extinguish said fires, and upon failure to do so, such person shall be punished by a fine of not exceeding five hundred dollars or by imprisonment in the county jail not exceeding six days, or by both such fine and imprisonment. All persons having charge of men in the construction of such railroads shall see that the provisions of this section are carefully complied with, and for any negligence or want of ordinary care on their part in relation to the same, they shall be liable to the penalties imposed by this section.

Section 52. Any railroad company violating the requirements of sections forty-eight, forty-nine and fifty, shall be liable to a fine of one hundred dollars for each offence.

#### SLASH LAW

Revised Statutes, Chapter 8 as Amended by Chapter III—Public Laws 1919

Section 53. Any person, firm, corporation or agent, cutting any forest growth on property adjacent to the right of way of any railroad or highway within the State, shall leave the growth uncut on the land within fifty feet of the limit of the right of way of a railroad or center of the wrought portion of any plantation, town, city, county or State road; or shall dispose of slash

and debris caused by cutting in such a manner that inflammable material shall not remain on the ground within fifty feet of the limit of the right of way of a railroad or center of the wrought portion of any plantation, town, city, county or State road. Provided, however, that consent and direction in writing from the forestry department shall be required for the burning of such brush or slash except when the ground is covered with snow. The forest commissioner shall cause to be furnished to all the chief forest fire wardens and to the municipal officers of all towns and organized plantations of the State, blank permits, signed by him, for the burning of brush or slash. Any chief forest fire warden or the municipal officers of the town, in the county where the land is located, shall have full authority to countersign and grant such permits signed by the forest commissioner. The forest commissioner may, however, in any particular case called to his attention, overrule the decision of the chief forest fire warden or the municipal officers, and himself grant the permit asked for or forbid the granting of the same. Whoever violates any of the provisions of this section shall on conviction thereof be punished by a fine of fifty dollars.

Section 54. Slash and debris accumulating by the construction and maintenance of railroads, highways, power company, telegraph or telephone lines, shall be disposed of in such a manner that inflammable material shall not be left on the ground. Whenever slash or debris or inflammable material are found on the ground having accumulated as the result of the construction and maintenance of railroads, highways, power company, telegraph or telephone lines, contrary to the terms of this section the person responsible therefor, or his employer, whether individual, firm or corporation, shall be punished by a fine of fifty dollars.

Section 55. When any person, firm or corporation or agent, shall have failed to dispose of slash and debris as provided by the two preceding sections the forest commissioner shall notify the owner of the land of the requirement of this statute, and if such owner, within reasonable time, shall fail to destroy or remove such slash or debris such commissioner shall cause such slash and debris to be so disposed of. He shall pay the expense of so disposing of such slash and debris from any funds at his disposal, legally applicable to such purpose; and he or his successor in office shall be entitled to recover the amount of such expenditures in an action of debt, to be prosecuted by the attorney general in the supreme judicial court in the county where the land lies, against the person, firm, corporation or agent, whose duty it was to dispose of such slash and debris; and there shall be a lien on the land on which the cutting of forest growth took place, to secure any judgment recovered in such action, to be enforced by attachment in said action, made within six months after such expenditures were made. This remedy shall be additional to the penalty provided in said sections.

## CHAPTER 168

### Public Laws—1919

Any person, firm, corporation or agent who cuts any wood or lumber within the woodlands of this State and desires to dispose of the slash and debris caused by such cutting or clearing by burning, shall be first required to obtain a permit therefor in accordance with the provisions of section 53 of

chapter 8 of the revised statutes, and on failure thereof shall be subject to the penalty provided in said sections.

### CAMP FIRES

Chapter 30, Section 15. Whoever kindles a fire, on land not his own, without consent of the owner, forfeits ten dollars; if such fire spreads and damages the property of others, he forfeits not less than ten, or more than five hundred dollars, and, in either case, he shall stand committed until fine and costs are paid, or he shall be imprisoned not more than three years.

Section 16. Whoever with intent to injure another, causes a fire to be kindled on his, or another's land, whereby the property of any other person is injured or destroyed, shall be fined not less than twenty nor more than one thousand dollars, or imprisoned not less than three months, nor more than three years.

Section 17. Whoever for a lawful purpose kindles a fire on his own land, shall do so at a suitable time and in a careful and prudent manner; and is liable in an action on the case, to any person injured by his failure to comply with this provision.

Section 18. Persons engaged in driving lumber may kindle fires when necessary, but shall use the utmost caution to prevent them from spreading and doing damage, and if they fail so to do, they are subject to all the foregoing liabilities and penalties, as if said privilege had not been allowed.

Section 19. The Common Law right to an action for damages done by fires, is not taken away or diminished, and it may be pursued notwithstanding the penalties herein set forth, but any person availing himself of section seventeen is barred of his action at common law for the damage so sued for. And no action shall be brought at common law for kindling fires in the manner described in section eighteen; but if such fire spreads and does damage, the person who kindled it, and any persons present and concerned in driving the lumber, by whose act and neglect such fire is suffered to do damage, are liable, in an action on the case, for such damage.

### PUBLIC LAWS 1919

#### CHAPTER 43

##### An Act to Provide an Appropriation for General Forestry Purposes

Section 1. There shall be appropriated for the year nineteen hundred and nineteen the sum of five thousand dollars, and for the year nineteen hundred and twenty the sum of ten thousand dollars to be expended under the direction of the forest commissioner for general forestry purposes, including the reforestation of waste lands acquired by the State by grant or purchase; the encouragement of reforestation by private owners; the enforcement of all existing and future legislation relating to forestry, and the general improvement of forest growth both within and without the Maine Forestry District.

Section 2. The money appropriated in accordance with section one of this act shall constitute a permanent fund and the unexpended balance in any year shall not be permitted to lapse, but shall be available in future years for the purposes outlined in said section.

Section 3. The forest commissioner may in any year with the advice and consent of the governor and council use any unexpended money accumulated from previous years for the enlargement or development of state forest reservations.—(Approved March 12.)

#### CHAPTER 71.

An Act to Amend Section One of Chapter Eight of the Revised Statutes Relating to the Tenure of Office of the Land Agent.

Section 1. Section one of chapter eight of the revised statutes is hereby amended by striking out the words "holds his office during their pleasure" in the second and third lines of said section and inserting in place thereof the words, 'be a trained forester or a person of skill and experience in the care and preservation of forest lands, and shall hold such office for a term of four years', so that said section, as amended, shall read as follows:

'Section 1. The governor with the advice and consent of council shall appoint a land agent, who shall be a trained forester or a person of skill and experience in the care and preservation of forest lands and shall hold his office for a term of four years and shall give bond to the State in the sum of fifty thousand dollars with sufficient sureties or with one or more surety companies authorized to do business in the State, as surety or sureties, satisfactory to the governor and council for the faithful performance of the duties of his office. The land agent shall superintend and manage the sale and settlement of the public lands. He shall not when appointed, or while in office, be directly or indirectly concerned in the lumber business on the State lands, or in the purchase thereof, or of any timber or grass growing or cut thereon.'

Section 2. The first appointment under the foregoing provision shall be made January first in the year of our Lord one thousand nine hundred and twenty.—(Approved March 17.)

#### CHAPTER 166.

An Act to Provide for the Acceptance by the State of Gifts of Land and for the Establishment of a State Park and Forest within the State of Maine.

Section 1. The State land agent and forest commissioner may, with the advice and consent of the governor and council, accept on the part of the State gifts of land for forest and park purposes. The title to lands acquired under this section shall be investigated and approved by the attorney general of the State.

Section 2. The purpose of this acquisition of land is hereby declared to be the preservation of scenic beauty, facility for recreation as nearly unrestricted and general as is practicable by the people of this State and those whom they admit to the privilege, and the production of timber for watershed protection and as a crop. The lands acquired within the limits described in section one shall never be sold. They shall be protected from fire and damage from other sources in an efficient and economical way. They may be improved by roads and trails and also reforested under direction of the land agent and forest commissioner according to his best knowledge and judgment when funds are available for that purpose. Timber may be sold and camp sites leased by the State land agent and forest commissioner with the approval of the governor and council when in accordance with the purposes of this act

as previously stated; no contract of either character to be for a term of more than five years. Revenues derived from these uses shall be paid to the State treasury by the said land agent and forest commissioner and constitute a fund to be applied to the care and improvement of these lands or to the acquisition of other lands for similar purposes.—(Approved April 3.)

#### CHAPTER 219.

##### An Act for the Care and Preservation of Shade and Ornamental Trees.

Section 1. All trees within or upon the limits of any highway marked as hereinafter provided are hereby declared to be public shade trees. The tree wardens in the several cities and towns, as soon as may be after they are appointed as hereinafter provided, shall carefully examine the trees along the highways under their jurisdiction and plainly mark such trees as they consider should be controlled by the municipality. The forest commissioner shall furnish to the municipal officers of the several cities and towns, at cost, galvanized iron disks not more than one inch in diameter, which disks shall have stamped on them the letter "M." Said disk shall be inserted in each tree, selected as above provided, at a point not less than three feet nor more than six feet from the ground on the side toward the highway. It shall be the duty of the tree warden, if any tree marked shall be destroyed or defaced, to renew or replace the same.

Section 2. All public shade trees shall be under the care and control of park commissioners in cities and towns which now or hereafter may appoint such commissioners in accordance with sections eighty-four to ninety-three inclusive of chapter four of the revised statutes. As to all such trees said park commissioners shall have the powers and duties hereinafter conferred upon tree wardens.

Section 3. The municipal officers of cities and towns not having elected park commissioners as provided by sections eighty-four and ninety-three, inclusive, of chapter four of the revised statutes, may at any annual meeting or meetings called for that purpose appoint one or more tree wardens, who shall have the care and control of all public shade trees upon and along such highways and in the parks thereof and all streets within any village limits and shall enforce all laws relative to the preservation of the same.

Section 4. Public shade trees may be trimmed, cut down, or removed by the owner of the soil only with the consent of a tree warden or park commissioner, but such trees shall not be trimmed, cut down or removed in any case by a tree warden or park commissioner except with the consent of such owner. Nothing in this section, however, shall be construed to prevent the trimming, cutting or removal of trees where such trimming, cutting or removal is ordered by proper authority to lay out, alter or widen the location of highways, to lessen the danger of travel on highways or to suppress tree pests or insects.

Section 5. Cities and towns may appropriate at any annual or special town meeting money not exceeding fifty cents for each taxable poll in each year to be used in making compensation to tree wardens, and in acquiring, planting, pruning and protecting shade trees.

Section 6. Whosoever trims, cuts or otherwise defaces or destroys a public shade tree or injures, defaces, or destroys any tree marker attached in



accordance with section one hereof, shall be punished by a fine of not less than five nor more than twenty-five dollars to be paid to the city or town in which the offense is committed, and expended by said city or town for the purposes outlined in this act as the same may be amended from time to time.

Section 7. The forest commissioner may provide and distribute free of charge at the State nursery, to the several cities and towns, trees for roadside planting.

Section 8. When the municipal officers in any year fail to appoint tree wardens in accordance with section three of this act the provisions of section six shall not apply to previously marked trees in accordance with this act.— (Approved April 4.)

#### FOREST LAND EXEMPTED FROM TAXATION

Revised Statutes, Chapter 10.

Section 6. XI. Whenever a land owner plants or sets apart for the growth and production of forest trees any cleared land or lands from which the primitive forest has been removed, and successfully cultivates the same for three years, the trees being not less in numbers than six hundred and forty on each acre and well distributed over the same, then, on application of the owner or occupant thereof to the assessors of the town in which such land is situated, the same shall be exempted from taxation for twenty years after the expiration of said three years, provided, that said applicant at the same time files with said assessors a correct plan of such land with a description of its location, and a statement of all the facts in relation to the growth and cultivation of said incipient forest; provided, further, that such grove or plantation of trees is during that period kept alive and in thriving condition.



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**Forestry Department**

**and**

**State Nursery**

**at**

**University of Maine.**

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**DIAMETER LIMIT CUTTING MISAPPLIED.**

The trees left should have been taken, as they were too far suppressed to recover after the cutting.

Photo by Maine Forestry Dept.

# DEPARTMENTS AT UNIVERSITY OF MAINE.

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## REGISTRATION

After the close of the war the recuperation of the Forestry Department was immediate and rapid. In the fall of 1919 many new students registered in this course, and a number of the former students, just returned from overseas, returned to complete their work in this Department. The total registration in the Forestry Department in the fall of 1919 was forty-eight major students taking the full four years' course, and more than fifty other students from other Departments of the University elected one or more forestry courses.

The total registration of forestry majors was as follows:

Seniors .....	8
Juniors ..... 2	2
Sophomores .....	19
Freshmen .....	16
Specials .....	3

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Total .....	48
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In spite of the very unusual conditions shared in by all educational institutions during the past several years, we were able to graduate five men in 1918 and two men in 1919. And it is expected that by commencement of 1920, eight more men will have finished the requirements for the degree of Bachelor of Science in Forestry, and will receive their degrees as of the Class of 1920.

## FACULTY

On the resignation of Professor C. W. Eaton, we were very fortunate to be able to secure the services of Mr. C. W. L. Chapman as Instructor of Forestry and assistant in the Department. Mr. Chapman graduated from the school here in 1914, and has since had five years of practical work and teaching in this country, as well as overseas experience during the war.

## EQUIPMENT

Some 200 new stereopticon slides have been added to the permanent equipment. No new purchases were made other than replacements during the years of the war, but it will be necessary to add considerably to the equipment during the next year or two to provide for the increased registration.



STATE FOREST NURSERY.

The State of Maine supports a forest nursery at Orono, Maine, for the propagation of young forest trees for planting within the State. This young stock is furnished at absolute cost f. o. b. Orono. This building is devoted to packing and shipping the nursery stock.

Photo by Maine Forestry Dept.

## X. S. P.

A chapter of Xi Sigma Pi (Gamma Chapter) has been organized in connection with the Forestry Department. This is the National Honor Society for students in forestry. Only men with an average rank of 75% or better and no failures in forestry subjects are eligible for election to the society. The object being to stimulate scholarship as well as to promote good-fellowship.

## PUBLICATIONS

During the past year we were able to make a coöperative agreement for entomological investigations in Maine. The Forestry

Department in coöperation with the Maine Agricultural Experiment Station secured the services of Dr. M. W. Blackman, Ph.D., Professor of Entomology, Syracuse University, for the summer of 1919.

Besides doing considerable original work on bark insects, Dr. Blackman gave us the manuscript for two very excellent bulletins, one on the Spruce Budworm and the other on the White Pine



#### STATE FOREST NURSERY.

Preparing the seed beds. This work is done by the students in the Forestry School.

Photo by Maine Forestry Dept.

Weevil. A supply of these bulletins is still available, and will be sent free to applicants.

For lack of sufficient funds, other needed publications have had to be deferred. It is hoped that a more liberal appropriation will be made next year for carrying on this work.

#### STATE FOREST NURSERY

The State Forest Nursery is now self-supporting. It is no longer to be considered in any way as a liability but as an asset to the State. Sales for 1919 amounted to 193,625 trees, and brought in \$1,185.65, or more than the appropriation for carrying on the work.



Of the sales, 134,865 trees were transplants and 58,760 were in the seedling stage when sold.

From present indications sales for 1920 will nearly double those for 1919, and we have had a larger demand for seedling stock than at any time since the nursery was started.

The State Forest Nursery has stimulated the interest in forest planting, not only in the case of the private owner, but also with



STATE FOREST NURSERY

After a certain age (from two to three years according to species) the seedlings are transplanted. The picture shows the preparation of the trench for transplanting. Also at the left are shown the young transplants set one and one-half inches apart in rows at intervals of six inches. The season of the year can easily be assumed, as the fruit trees in the background are in full bloom.

Photo by Maine Forestry Dept.

many of the large pulp and paper companies, and the demand for planting stock is rapidly increasing.

White Pine and Norway Spruce were the species most in demand, with a small amount of Red Pine. Seed of the latter species has been out of the market for the past two years, so that we have been unable to provide for the future with this species as we should have liked to. We have, however, several thousand three- and four-year-old transplants of this species and a smaller amount of large twice transplanted stock now six years old.

Limited quantities of Scotch Pine and Mungo Pine are also on hand for next spring delivery and a number of excellent young poplars, grown from cuttings, and now from 6 to 12 feet high.

Orders this year exceeded the supply, which, owing to the few students in attendance during the years of the war, and to the impossibility of securing local labor, was not as large as it would have been under normal conditions.

The space allotted for this work is, however, too small, and there is no room for expansion on the Campus. It is greatly to be hoped that sufficient funds will be provided for starting another and larger nursery, preferably in the southern part of the State, in addition to and in coöperation with the State Forest Nursery at Orono.

Our nursery here is of vital importance to the work, as it is the laboratory for the students of forestry, in which they acquire first-hand knowledge of nursery practice, and it is also valuable for experimental purposes: but it is not large enough to meet the demands now coming in from all parts of the State for forest planting stock. Either temporary subsidies should be provided for



Growth of Young Spruce and Fir in Old Logging Road.  
Photo by Maine Forestry Dept.

encouraging private owners to meet the demand, or an auxiliary nursery should be started for the purpose primarily of growing forest trees in large quantities, and at a price to warrant economic forest planting in Maine.

### CONCLUSION

While the war put a temporary check on the natural development of the Forestry Department, just as it did with every other



Building the Log Camp.

Photo by C. W. Grover.

phase of educational work, this check has now been removed, and we will progress just as fast and as far as the Legislature of Maine sees fit to provide funds for the development of this work. To anyone familiar with the natural resources of Maine, this would seem to be a good business proposition, since it is fundamental and basic for the best development and utilization of our forests.

Respectfully submitted,

(Signed)

JOHN M. BRISCOE,  
*Professor of Forestry.*

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Report on the

**Spruce Budworm**

and

**White Pine Weevil**

by M. W. Blackman, Ph.D., Professor of Entomology,  
New York State College of Forestry,  
at Syracuse University.

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### HARDWOOD OPERATION.

Rafted hardwood logs piled at the mill.

Photo by Maine Forestry Dept.

## THE SPRUCE BUDWORM.

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Investigations carried on by the Forestry Department of the University of Maine and the Maine Agricultural Experiment Station, at Orono, 1919.

**T**HE Spruce budworm (*Tortrix fumiferana* Clemens) is with small doubt the most destructive enemy of the spruce, fir and hemlock in Maine. It is probably native to this country, although it is well known in England. An account of the earliest known injuries by the budworm is given by Dr. Packard in which he establishes the probability that the wide-spread destruction of spruce in the Casco Bay region in 1807 was due to this insect pest. However this may be, it is certain that it was responsible for the death of a large percentage of the red spruce in this same region and also in many other localities along the coastal area of Maine from Portland to Rockland, in an infestation which reached its apex in 1878 and 1879. This outbreak, so far as we know, was confined to the islands and coastal area and did not extend inland any great distance. Following this great destruction, the insect seems to have disappeared so far as attracting any general attention is concerned for a period of more than thirty years. However, since 1911 numerous inquiries and complaints of its depredations have been received both by the Entomologist of the Maine Agricultural Experiment Station and by the Department of Forestry.

The present outbreak seems to be a much more serious and destructive one than that of thirty years ago, for its extent comprises not only the coast regions but practically every wooded area of the state. Indeed by far the greatest amount of damage has occurred in the inland portions of the state, especially in Somerset, Piscataquis, Aroostook and Washington Counties in regions remote from the coast and covered with dense forests of spruce, balsam fir and mixed hardwoods. From enquiries sent in to the Experiment Station and the Department of Forestry, from reliable information from various sources, and from personal observation, it is certain that the insect was present to an alarming extent in



Franklin, Cumberland, Lincoln, Piscataquis, Penobscot, Waldo, Knox, Aroostook, Washington and Hancock Counties. It is also certain that it was to be found in Oxford, Somerset, and Sagadahoc Counties, and almost as certainly in the remaining three counties of the state. However, the greatest damage was done in the great inland spruce and balsam forests of the northern half of the state which are the main source of supply for the pulp mills.

Usually one's attention is first attracted to this insect in the spring or early summer by the wilted or blighted appearance of the new growth at the ends of the branches and twigs of spruce and balsam. This has often been described as resembling the effect produced by the passage of a light fire through the woods. If these blighted tips are examined they will be seen to be made up of the ends of the needles or leaves of the new spring growth which has been gnawed through at the base, but are still held loosely together by a silken, web-like substance. If one of these loose masses is opened, one or several caterpillars are likely to be found within. These are the culprits responsible for the damage. Each when about full grown is from  $\frac{1}{2}$  to  $\frac{3}{4}$  of an inch long, with dark, nearly black head and with body of a general brown color, more or less diffused with green at the sides. Each segment has several light-colored warts; dark at the center, from which arises a hair. The insect begins feeding in the spring soon after the development of the new needles and as they eat only the bases of these, the entire new growth is usually destroyed before the caterpillar reaches its full size about the middle of June. The uneaten portions of the leaves are held together by means of a silken thread spun by the larvæ, which thus forms a loose but more or less complete covering or shelter in which it remains at all times. If all of the new growth is destroyed before the larva becomes full fed, it extends its operations toward the base of the twig and feeds upon the older needles.

The larvæ are usually full grown during the first half of June, and, still in their loose shelter of gnawed-off needles, transform to pupæ. These, in the course of the next week or two, give rise to medium-sized, brownish-grey moths, which in infested regions are flying in numbers during the last week in June and the first half of July. The moths deposit their eggs in small, light green masses on the sides of the needles. These eggs are flat and rather scale like and are so placed that they form small oval masses which are so inconspicuous as to escape casual notice. The eggs are all laid before the last of July and the larvæ from them hatch in a week or ten days. These minute larvæ feed for a time, but perhaps only

sparingly, and pass the winter as small, only partly grown caterpillars. It is in the spring and early summer that their appetite seems most voracious and when they do the greatest damage.

The feeding of the larvæ upon the developing tips of spruce or balsam usually completely kills them and as no more can be reproduced until the following season the tree is greatly weakened. However, to completely kill the tree, it is necessary either that all or nearly all of the old leaves be also eaten, or that the destruction of the buds shall continue several seasons, or that the greatly weakened tree shall be attacked by other insects, such as borers which complete the destruction. Thus but few trees are killed the first year of attack unless complete defoliation both of the new and old needles has resulted, but for the succeeding few years the results are cumulative, as each succeeding crop of new leaves is nearly entirely destroyed, while in the meantime the old ones are being lost in the natural way. When, however, bark beetles and bark weevils attack trees already weakened by nearly complete defoliation, as has been recently reported by Swaine in Canada, they find but little resistance to overcome and the trees readily succumb.

In order to determine by personal observation the amount of damage done by the caterpillars, the writer spent a week in the forests of Piscataquis County, several days in the Rangeley Lake region, and another week in observation in the coast region from Bangor to Kittery Point. In the coast region the infestation is decidedly on the wane. Considerable damage has been done to the rather small more or less scrubby spruce upon the islands and points in the vicinity of Casco Bay, but indications are that the injuries by the budworm are nearly over for the present. On Harpswell Neck, which was visited in company with Professor J. M. Briscoe of the Forestry Department, many of the small scrubby spruce near the roadside had been partly or entirely defoliated when the observations were made (June 28-30), and some were in a dying condition. At this time many moths were on the wing and many pupæ were still to be found attached to the defoliated twigs. However, a large percentage of the trees were only partially defoliated and will undoubtedly recover. At several places the injured or killed spruce had been cut and converted into cord-wood which was piled along the roadside.

The Rangeley region was visited early in September and here also the injury by the budworm seems to be on the decrease. Conclusive evidence of its presence was found in the partly defoliated



YOUNG POPLAR.

Although only twelve years old some of them are five inches in diameter breast height.

Photo by Maine Forestry Dept.

spruce and fir, showing the characteristic work of this insect. In some cases the empty pupal skins still adhered to injured twigs. Along the woodland trail from York's Camp, Loon Lake, to Richardson's Camp, Kennebago Lake, quite a number of the balsams have been killed during the last several years, but a large percentage even of the larger growth had escaped. But relatively few spruce trees were dead, although many showed the effects of partial defoliation in the presence of dead

branches and leaders. The work of the caterpillar during the past summer (1919) has resulted in only partial defoliation, and in practically all cases observed, the trees will doubtless recover. Apparently the present infestation has at no time been disastrously heavy in this locality.

The observations in Piscataquis County were made during the latter part of July in company with Dr. C. T. Brues, of the Department of Entomology of Bussey Institution, Harvard University, and Mr. H. B. Shepard, Forester for the Eastern Manufacturing

Company. The trip was made by automobile from Lily Bay on Moosehead Lake, to the foot of Chesuncook Lake, thence by boat, canoe and on foot through Chesuncook Lake, Round Pond and Telos Lake. By this route observations were made in some thirteen townships and included a variety of conditions. Without doubt the greatest amount of damage encountered on this trip was to be observed in the forests at each side of the road between Lily Bay and Ripogenus Dam in the holdings of the Great Northern Paper

Company. In certain localities, often of considerable extent, practically every fir, red spruce, and hemlock of any considerable size had been killed and most of the younger trees down to a height of only a few feet, were either killed or badly injured and distorted. The occasional white spruces seemed to have escaped with no injury or with only minor damages. Indeed, throughout the entire area examined, the white spruces seemed to possess some degree of



GROWING SPRUCE.

These trees left on the edge of a yard as undersized ten years ago when cutting to a limit of ten inches breast height, are now fourteen inches in diameter breast height. Photo by Maine Forestry Dept.

immunity from attack and injury, although in the regions of Houlton, according to the observations of Mr. Wm. C. Woods reported by Dr. O. A. Johannsen in Bulletin No. 210 of the Maine Experiment Station, the white spruce was second only to the balsam fir in susceptibility. However, there can be no doubt of the accuracy of our observations, and they are confirmed by those of Mr. Shepard, extended over a much larger area of this region. Indeed, the comparative immunity of white spruce was first pointed out by him. It is possible that some unknown local condition may be responsible for this difference in the two localities.

Several days were spent in making observations in Townships 7-R-12, 6-R-11, 5-R-11 and 6-R-12, all but the last of which are included in the holdings of the Lincoln Pulp Wood Company. While the conditions here are not so bad as in the Lily Bay region, there is evidence everywhere of a very severe and injurious infestation. In many localities, especially in the denser portions of the forests where conditions have remained undisturbed by the lumbermen for years, practically all of the larger firs and often-times as much as from 40 to 50 per cent of the larger red spruce have been killed by the bud-moth within the last few years. The hemlock has also suffered a high mortality and much of the younger growth of spruce and balsam has been severely injured,—some of it past recovery.

A number of trees, some recently dead, others apparently dying, and others seriously and nearly completely defoliated, were felled in order to examine them for boring insects, either bark beetles, weevil or others, which might follow the attack of the bud-worm and contribute to the death of the trees weakened by defoliation. In the balsam fir, the larvæ of the "sawyer" *Monohammus scutellatus* were nearly invariably found in recently killed trees. Some of these had doubtless entered the tree while it was still alive and sappy, but in a weakened condition, but the majority had certainly entered trees injured past hopes of recovery. Many of the balsams, though by no means all of them, had been attacked by the balsam bark beetle *Pityokteines sparsus* Lec. (*Ips balsameus* Lec.) and the weevil *Pissodes dubius* in the trunk regions, while the smaller limbs and twigs harbored numerous broods of another small bark beetle *Cryphalus balsamows* Hopk. There is no doubt that in some cases all three of these forms had entered and ensured the death of trees which had been much weakened by the budworm and which otherwise might have recovered. It is equally certain that in the majority of cases the trees had been either killed or weakened

beyond recovery by the work of the caterpillars, and the beetles, when present, were secondary enemies, entering trees already dead or sure to die.

Nearly all of the dead and dying spruce had their bark riddled by the burrows of the spruce bark beetle (*Polygraphus rufipennis* Kirby). Several also contained the brood of *Dryocoetes affaber* Mannh (*D. piceae* Hopk.), another bark beetle attacking the trunk region, while the tops and limbs of several had been attacked by *Eccoptogaster piceae* Sw. The sawyer *Monohammus scutellatus* also breeds in the recently killed spruce although not in such numbers as in balsam. In several dying spruce examined were found the larvæ and young adults of a weevil *Pissodes nigrae* living in bark not yet dead. There is little doubt that several of these beetles, including *Polygraphus rufipennis*, *Eccoptogaster piceae* and *Pissodes nigrae*, often hasten the death of much weakened trees, and in some cases at least, insure the death of trees which would otherwise survive.

One of the most encouraging observations made in connection with this infestation is that the destructive work of the budmoth larvæ is decidedly on the decrease. In the Chamberlain Lake and Telos Lake region comparatively few spruce trees and a much lessened number of balsam trees have been killed during the past year, when compared with the numbers killed in 1917 and 1918. Another very cheering observation is the recuperative ability shown by the spruce especially. Trees which were known to have been nearly completely stripped last year and which then seemed almost certainly doomed, showed a much improved condition during July of this past season and will certainly survive unless there is a recurrence of the attack. Such a recurrence is not probable for some years as the parasites of the caterpillars, together with other natural checks, seem to have the budworm under control. If past history repeats itself, as we have every reason for believing it will, there will be no widespread, serious injury for another period of from 20 to 40 years. It is likely, however, that during the next few years a few trees will continue to be killed in some localities, but there is no reason to expect such widespread devastation as has occurred since 1912.

While it is undoubtedly possible to control the bud moth by spraying the affected trees in the spring with arsenate of lead (5 lbs. to 100 gals. of water), this is practical only for ornamental and park trees. The best results will probably be obtained by two sprayings at an interval of about ten days—the first to be done when



the buds are just opened in the late spring and before injury by the larvæ is evident. In woodlands such a procedure is of course impractical, both from the standpoint of cost and from the impossibility of penetrating the wilds with a high-power spraying outfit. Indeed, in the forests man's only hope is the natural checks such as parasitic and predaceous enemies which nearly invariably in the course of a few years control any extraordinary outbreak of injurious insects.

The woods land owner can, however, lessen the danger of the much increased loss which will occur if the trees which are weakened by the budworm are attacked by hordes of beetles capable of breeding in them and completing their destruction. This he can do by using proper methods in his logging operations. If stumps are cut high and tops are not properly utilized they serve as excellent breeding places for bark-beetles, weevil, and other boring beetles, many of which when sufficiently numerous will attack and kill weakened or even apparently healthy trees. However, if the stump is reduced to the minimum, the top utilized as far as possible, and the slash properly disposed of, there is less opportunity for these injurious insects to breed and less likelihood of their breeding up to numbers sufficient to become notably injurious. In forests under natural conditions for many years, these insects are always present, but in the Northeastern United States, except following windstorms, fires and lumbering operations, they do not usually occur in numbers sufficient to do widespread damages. Perhaps the chief reason why only a small per cent of the fir and spruce in the Chamberlain Lake region which was weakened but not killed by the budworm, was attacked by weevils and bark beetles, is that a considerable time has elapsed since this locality has been cut over, and the injurious forms were not present in numbers sufficient to take advantage of but a few of the weakened trees.

Trees killed by the budworm are by no means valueless, as they will remain sound for several years and can be utilized for pulpwood, provided they are not riddled by wood boring insects. This is especially true of the spruce which seems to be more resistant to decay than is the fir, and at the same time seems to be less attractive to those borers which riddle the wood such as the "sawyers." A very large per cent of the balsam has suffered from "sawyer" injury and much of it will soon be valueless. Owners of woodlands in the regions infested should, in so far as it is practicable, concentrate their logging operations in the worst affected localities in an attempt to utilize as much as possible of the dead spruce, fir and hemlock before it becomes useless.

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THE WHITE PINE WEEVIL, WITH METHODS OF CONTROL  
AND RECOMMENDATIONS FOR A MODIFIED  
SYSTEM OF PLANTING WHITE PINE  
AND NORWAY SPRUCE

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At one time the greater part of the southern half of Maine was covered with forests in which the White Pine was the predominating tree. From this fact the state became popularly known as the "Pine Tree State." Even now the uncultivated portions of this region support many pine trees and they reproduce naturally surprisingly well, so that many of the rocky hillsides, farm woodlots and pastured woodlands contain a large percentage of new growth pine. But how different are these crooked, scrubby or bushy pines from the tall trees with their clean, straight boles, characteristic of the original virgin forests of this region. A great majority of the new growth is of no value commercially except as it furnishes a very inferior quality of stove wood and is at least of very doubtful ornamental value.

It is undoubtedly true that a considerable part of the land of southern Maine is better fitted for the rearing of forest trees than for any other use. Foresters usually agree that the white pine grows more rapidly, can be harvested sooner, and yields a larger return in a shorter time than any other planted forest tree suitable to this region. However, in spite of these undisputed facts, it is very questionable whether under present conditions, it is wise to advise the making of pure plantations of this valuable timber tree. This is because of two very serious enemies which threaten the destruction of its life or its commercial value. One of these, the Pine Blister Rust, is a fungus disease accidentally introduced from Europe, while the other is an insect native to this country—the White Pine Weevil. At the present time more frequent mention of the former of these two pests is heard by those interested in the preservation of our forests, than of the pine weevil. This is due largely to a well-organized propaganda based upon a real menace to the white pine and its kindred species, and should in no degree be discouraged or hampered. It is doubtless also due to the fact that a new, formerly unknown danger always appeals more strongly than an equally great or even greater one, to which one has become

accustomed, by long association. It is indeed very doubtful if the blister rust is as important an enemy to the production of white pine timber as is the pine weevil.

The adult of the white pine weevil is a small brown beetle, about  $\frac{1}{4}$  of an inch long, with two grey or white band-like markings across each hard, shell-like wing cover. It differs from the more ordinary beetles in the possession of a long snout-like extension of the head equal to about  $\frac{1}{4}$  of the body length. The insect usually passes the winter in the adult condition and leaves its hibernation quarters early in the spring and immediately flies to young pine trees. Here the female seeks the terminal shoot or leader of a tree and places her eggs under the bark of that part of the leader produced the preceding year. This she accomplishes by excavating a number of shallow pits in the bark with her biting jaws which are at the end of the snout, and by then reversing her body and placing her eggs in these cavities from the end of her abdomen. Wherever the leader is injured in this manner, droplets of pitch are exuded which soon harden, and thus indicate the leaders in which eggs have been oviposited. The depositing of eggs begins with the first few warm days of spring—usually during April—and continues actively for several weeks or a month. The exact season of egg-laying cannot be stated, as this varies with the locality, and in the same locality varies with the advancement of the season. Some egg-laying may occur as late as the latter part of June, but it is usually mostly completed by the middle of May.

The eggs usually hatch within a period of eight or ten days, each producing a small white larva or grub, which feeds voraciously under the bark of the terminal shoot, eating the cambium, the essential growth-producing portion of the tree. Usually the eggs are deposited in the upper part of the last year's growth and the grubs work downward, destroying the entire inner bark and completely killing the tissue as they proceed. As they become larger, the larvæ eat deeper and deeper into the surface of the sapwood and finally, in their last larval stage when they have reached about their full growth, they burrow into the wood, usually in the lower part of a terminal shoot. There they construct small oval chambers about one-third of an inch long, which are covered with partially chewed up bits of wood, known as "chip-cocoons." Within these cocoons which may lie either near the surface of the sapwood or in the pith, each larva changes into the stage known as the pupa, which requires no food and is capable only of feeble movements of the abdomen. The insect remains in

this stage for a period which varies with conditions of temperature and moisture. This transformation in the region of Orono was at its apex during the summer of 1919 in the latter part of July, although a few of the insects were still larvæ in the middle of August. The first adults of the new generation were obtained July 30, but these were but recently transformed from the pupæ and from a considerable number of infested leaders which were under observation; no adult emerged before August 5th. The adults continue emerging from the old hosts throughout the month of August and to a decreased degree during early September, while a few derived from eggs laid late, pass the winter in the old leaders either as larvæ or as young, immature adults. By far the greater number, however, emerge before September and on the approach of cool weather, seek some sheltered place in which to pass the winter.



THE BOOM WALKER

The care of one or more fin booms is intrusted to a watchman who keeps them in repair and clears away logs or drift that catch on the fins or braces.

Photo by Maine Forestry Dept.

The leader which has been attacked at first shows no signs of injury aside from the exudations of pitch already mentioned. The new growth begins normally, but soon after the larvæ begin feeding, the new growth above the injury begins to wilt, and soon turns brown and dies. As the larvæ continue feeding, the terminal continues to die farther and farther down and usually the entire leader down to the first whorl of laterals is killed. Occasionally, when the number of larvæ is greater than usual, they may continue their work of destruction below the upper whorl of laterals. In this manner, two years' growth and rarely three years' growth is killed.



Building Booms.

Photo by Maine Forestry Dept.

The killing of the leader in this manner throws the vitality of the tree into the next group of laterals below the injury. These turn upward; each develops a more or less strong growing tip, and they all contend for leadership. If these new leaders are not again attacked the result is the production of a forked or branched top, known among woodsmen as a "stag-horn pine." This either much decreases or entirely destroys the timber value of the tree, and at the same time detracts from its beauty. However, very often the new leaders

may be attacked year after year, resulting in the production of a stunted, bushy growth which has neither commercial nor esthetic value. Instances where this has been carried so far that from 25 to 100 leaders are striving for supremacy, may be seen by the thousands throughout southern Maine. Indeed, in this region, only a very small per cent of the young pines escape injury by the weevil.

While the pine weevil shows a decided preference for white pine (*Pinus strobus* L.) over all other species of trees, it will occasion-



ally attack other species of pine such as the jack pine (*Pinus banksiana* Lamb) and true pitch pine (*Pinus excelsa* Link.) Plantations of Norway spruce, especially, are often subject to great damage—second only to white pine in this respect. Young trees from 4 to 20 feet in height, are most subject to attack, although less commonly pines well over thirty feet high may be injured by the weevil. It also shows a decided preference for trees growing in plantations or in open stands. Thus it is that the most noticeable dam-

age usually occurs in pure plantations of white pine or Norway spruce or in the younger volunteer growth in pastures, along the borders of woodlands or along roadsides. Where white pine occurs under cover in woodlots it is nearly exempt from attack and injury.

**METHODS OF CONTROL.** The white pine weevil is best controlled by removing the infested leaders and so treating them as to destroy the contained grubs and young beetles before they have an opportunity to emerge and escape. This is most easily accomplished by burning, and should be done before July 1st. By this



Load of Logs and Lumberjacks.

Photo by C. W. Grover.



procedure all of the new brood is destroyed, but unfortunately all of its parasitic enemies are also killed. A better method, but one involving more trouble, is that recommended by A. D. Hopkins, of the U. S. Bureau of Entomology. He recommends that the collected leaders be confined in tight barrels, closed at each end with ordinary wire screen. This allows the smaller parasites to escape. By the time cold weather begins, all of the weevil will have emerged from the leaders earlier collected, and will have died, so that the screens can then be removed and the barrels and their contents left until the succeeding June to allow the emergence of the larger parasites which develop later. The leaders collected later in the season—those wilting after the middle of July—should either be burned at once, or should be kept screened until the midsummer following, as some of the weevil will not be ready to emerge until the following spring.

Plantations, whether known to be infested or not, and natural woodlands in the vicinity of plantations, should be inspected at least twice during the summer (late in June and again about the middle of July) and all wilted leaders collected and either burned at once or confined in screened containers as recommended above. It should be borne in mind that weevils develop just as readily in natural growths of pine where these occur in the open, as they do in planted trees. The adults are equipped with wings and are capable of flying for a considerable distance, so that no matter how clear of dying leaders a plantation be kept, it will certainly become reinfested if the weevil breeding in the woodlands of the vicinity are not also destroyed. Above all things, it should be borne in mind that the mere removal of the infested leader does no good, for the insects will breed just as readily in one broken off as in one still attached to the tree. It must either be destroyed by burning, or screened so that the emerging beetles cannot escape to infest new trees.

In plantations where an infestation is thoroughly established, or in a region in which the weevils are numerous, the collection and treatment of infested terminals should be supplemented by other measures to prevent, in so far as is possible, the beetle from depositing its eggs. One means to this end consists in the collection and destruction of the weevil while they are on the terminals preparing to oviposit. With but little practice the insects can be readily seen upon the leaders just below the terminal group of buds. If the tree is slightly jarred the weevils will release their hold of the stem and drop to the ground. Advantage may be taken of this habit in



### A NOBLE PRODUCT OF THE MAINE WOODS.

Game protection, as well as fire protection, should have the hearty co-operation of all good citizens, if Maine is to continue to be known as the home of big game.

Photo from J. K. Pooler.

collecting them. If an insect net or a light vessel containing a small quantity of kerosene or crude petroleum is held at one side of the leader, and the other side is tapped with a stick, the insect will invariably fall into the receptacle.

If an insect net is used, this should be emptied from time to time in a vessel of kerosene or petroleum, a thorough bath in which is always fatal. This collection and destruction of adults should be repeated at intervals of a week or ten days during the height of the egg-laying period. In southern Maine this would usually be from the beginning of warm days late in April, till early in June, when most of the adults have disappeared. Three or four thorough collections made in this manner will very much reduce the number of infested leaders, but those dying later should be removed and treated as recommended above. If these recommendations are followed thoroughly and conscientiously for several years, it will result in a very material lessening in the number of the weevil and if they are supplemented by widespread and thorough destruction of the infested parts of natural growth, the weevil will soon be entirely under control. But the work must be *thorough*, and to be lasting must be widespread.

Indeed, scientifically there seems to be no reason why the pine weevil should not be controlled throughout the state—or indeed throughout its range—and their numbers so reduced that a pine or spruce infested by them should become a rarity. There is no real reason why the “stag-horn” pines and the “bushy” pines along the roadsides and in the woodlots and plantations should not give place to symmetrical trees growing in the way nature intended them to grow; no reason why the present unsightly, stunted trees should not be replaced by objects of real beauty, and from being of no value, become the producers of the most valuable timber it is possible to grow in the state. The writer thoroughly believes that the control of the pine weevil is a practical proposition. All that is necessary is a concerted, coöperative effort by all land owners, directed and aided by a corps of experts employed by the State. The cost for a few years would be considerable, but it would not be excessive when the increased value of the woodlands is taken into consideration. The State would be a more attractive place to live in, and the coming generations would not only receive a heritage of greater beauty, but could also reap a crop of immensely greater value.

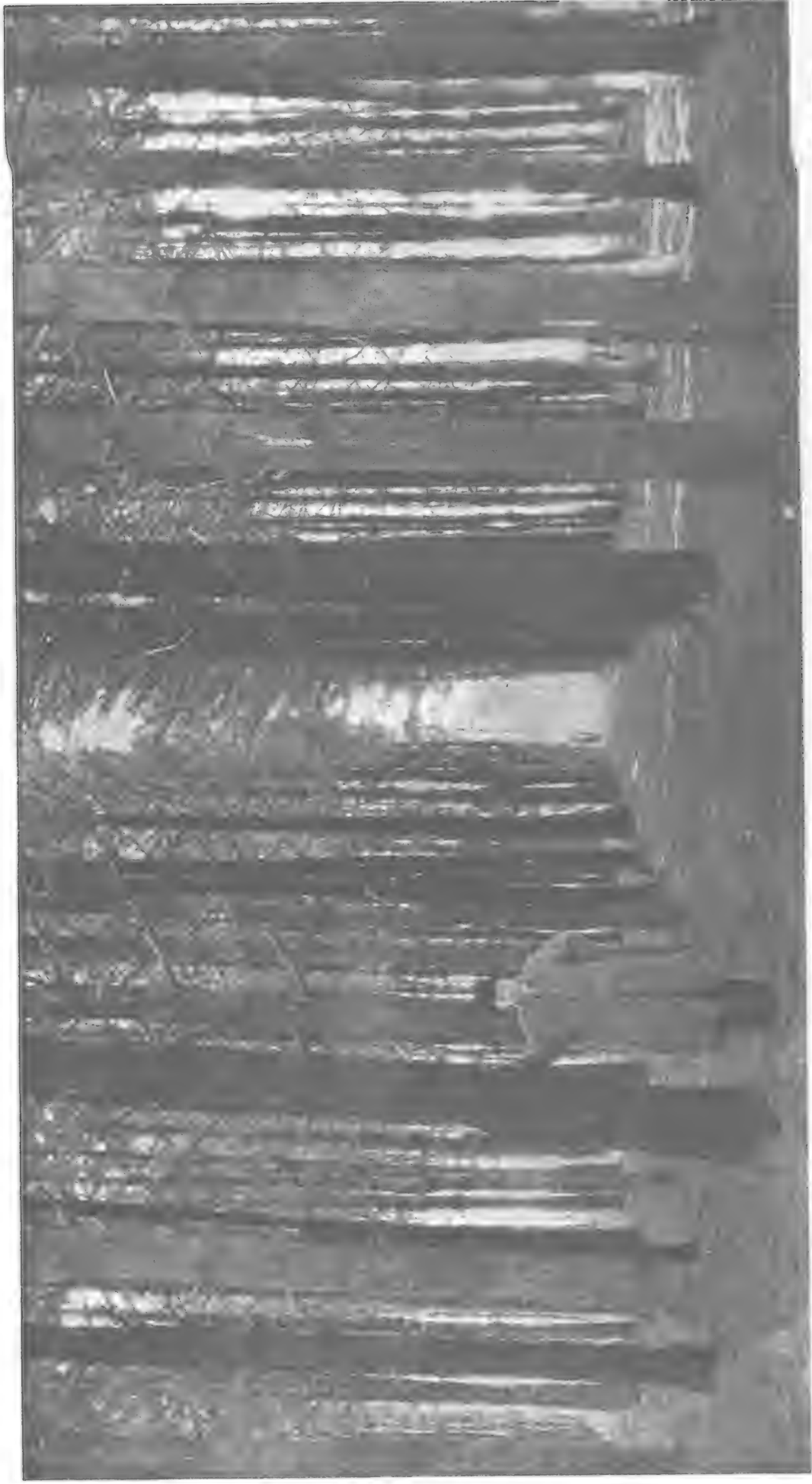
Even if state-wide efforts at controlling the pine weevil are not undertaken, much can be accomplished by co-operative community

efforts. Several public-spirited men in a community interested in the preservation and improvement of the woodlands of their region, can readily interest a number of their neighbors in a matter of this sort, and by a thorough, conscientious endeavor can do much to protect their pines and spruces and thus insure a more beautiful and profitable future for their locality. However, it should be borne in mind that several years' effort will be necessary to establish control and the results will be more or less temporary unless neighboring communities are coöperating.

#### SUGGESTED SYSTEMS OF PLANTING WHITE PINE AND NORWAY SPRUCE TO OBVIATE WEEVIL INJURY

The question is often asked why it is that while the virgin pines were most of them so perfect, the new growth is so markedly subject to weevil injury. It is believed the correct answer is that these perfect and symmetrical trees came up under cover of larger trees, either of the same or of other species, and were thus protected from injury. By the time their crowns reached through to the open above the surrounding trees, the pines were of such a size as to be exempt from attack, or if attacked, were injured but slightly. There is good reason for believing that any open woodland in this part of the country, if left untouched for several centuries, would at the end of that period have become as perfect a forest as was here when the white man first came, and that the predominating tree would be the white pine, provided a few good seed trees of white pine were present at the start. The history of such a forest would be somewhat as follows: A very large per cent of the first new growth of pines would be attacked by the weevil, and never reach a height of much more than thirty feet. A few would probably escape without injury or with only minor injuries. Later lots of pines coming up under cover of the older "bushy" growth would escape with a much smaller percentage of injury, and the survivors would eventually over-top the injured growth. Having reached a height where they were comparatively exempt from injury, some of them would continue to grow, and eventually they would become sufficiently numerous to suppress and kill the imperfect stunted trees by shading.

Such a process as that outlined above, however, would certainly require several centuries for its completion. The writer thoroughly believes that comparatively good results can be accomplished in a



WHITE PINE PLANTATION OVER SIXTY YEARS OLD; LOCATED AT EAST TAUNTON, MASS.

These Pine were set out about 1854. From measurements made by the Massachusetts State Forester's Office the average height is placed at sixty feet and the board feet to acre as 41,000.

Photo by Massachusetts Forestry Department.

much shorter time by using proper methods of planting, intelligently devised to combat the pine weevil. Observations made several years ago at the Great Bear Springs Plantation near Fulton, N. Y., first suggested that such a system might be possible. Most of the pine is there planted in blocks of pure white pine, Scotch pine, or Western yellow pine. However, in a small part of the plantation a dozen or so rows occur between two larger blocks of Scotch pine, and in still another place white pine and Scotch pine were planted in alternate rows. When examined, the injury by the weevil was serious in all of the blocks of pure white pine, while the other species showed no evidence of its attack. In the small block of white pine, surrounded by Scotch pine, only a few leaders were killed, while in that plot where the two species had been planted in alternate rows, no evidence of attack by the weevil was found. The two sorts of pine had been planted at the same time, but the Scotch pine, on account of its more rapid early growth, had outstripped the white pine and, at the time observations were made, was several feet higher. The protection of the white pine from beetle attack was probably due either to the higher, denser growth of the other species, or possibly the odor of the Scotch pine predominated and acted as a deterrent to the weevil. It is probable that both factors aided. The higher leaders of the Scotch pine protected the white pine by inducing the weevils to alight upon them, it being common observation that up to a height of 20 feet, the higher leaders in a plantation are more often chosen for ovipositing. The weevil, however, having alighted on a Scotch pine, found it undesirable for ovipositing and soon sought further.

It is the belief of the writer that a system of planting white pine can be devised which will give a large measure of protection to the young trees during the period when they are most susceptible to weevil injury. However, it will require a number of experiments carried out over a long period before the best system could be decided upon. Several experimental plots are suggested below. In all cases the rows should be laid out at right angle to the prevailing winds during the active period of the weevil.

*Experimental Plot No. 1.*—A plot of a minimum of several acres 6 ft. x 6 ft. as follows: The center of the plot to be planted with alternate rows of Scotch pine and white pine, surrounded by a border of at least six rows of Scotch pine, and this in turn surrounded by another band of at least six rows of pure white pine. This outer border of white pine would serve the double purpose of



a check plot to determine the normal percentage of infestation in pure stands, and would also serve as trap trees to induce ovipositing.

The history of this plot would probably be somewhat as follows: On account of its more rapid early growth, the Scotch pine would in a few years outstrip the white pine, and by the time the latter had reached a height when it would be attractive to ovipositing weevils, the Scotch pine would act as a cover or protection, so that at worst a much decreased percentage of white pine would be injured. But when Scotch pine reaches a height of 20 or 30 feet its further growth in height continues much more slowly and at this time the white pine would soon overtake and eventually outstrip the other species. But by the time this occurs, it would have reached a height where it would be less liable to weevil injury, and a large percentage would escape unharmed. The Scotch pine having served its purpose could then be cut and used either as cord wood, or converted into box boards or other cheap lumber. The gaps thus made should be immediately planted with new white pine which, growing up under cover, would be nearly immune to weevil injury.

In the meantime the border of white pine surrounding the plot, from the time the young trees reached a height of 5 or 6 feet, would suffer a large percentage of infestation. As soon as the leaders begin to wilt they should be removed from the young tree and treated as previously recommended. Many of these trees would soon become bushy growth, but they should be allowed to remain to serve as traps, and as soon as attacked, the infested parts should be removed. The inner border of Scotch pine would serve as a partial barrier and could either be cut when the trees of the same species in the center of the plot are removed, or could remain till the interplanting of white pine had become thoroughly established.

*Experimental Plot No. 2.*—Similar in general to Plot No. 1 but with Norway spruce or other species of spruce replacing the white pine in the center of the plot. The outer border may be either white pine or Norway spruce.

*Experimental Plot No. 3.*—Similar to Plot No. 1, but with the central area planted with alternate strips of from 2 to 10 rows each of white pine and Scotch pine, or of Norway spruce and Scotch pine. It is believed that not so high a percentage of protection would thus be secured but there would be less difficulty in removing the Scotch pine, and if desired this could remain until

more mature. Its removal would also be accomplished with less mechanical injury to the more valuable white pine.

*Experimental Plot No. 4.*—Similar in general construction to Plots 1 and 2, but with some rapid growing broad-leaf tree replacing the Scotch pine. It is believed at least equal immunity for the pine or spruce would be secured, but care would probably have to be exercised to prevent some of the pines from being shaded out. An occasional judicial thinning might be necessary, but this should not be carried far enough to make large openings in the cover until the size of the pines (more than thirty feet high) make them comparatively immune from injury.

There is every reason to believe that any of the experimental plots suggested above would be successful to a considerable degree. Perhaps a small percentage of the protected pines would suffer injury, but this percentage would never be great, and in no way compare with the injury in pure plantations or that occurring in the protecting border of trap trees. However, in all cases there should be a systematic effort at reducing the number of weevils by conscientiously collecting and treating the infested leaders throughout the plot, and better and more certain results will be secured if the natural growth in the vicinity is treated in a like manner. This would require only a few hours', or at the outside only a few days' labor per year especially if the man is equipped with long-handled pruning hook.

